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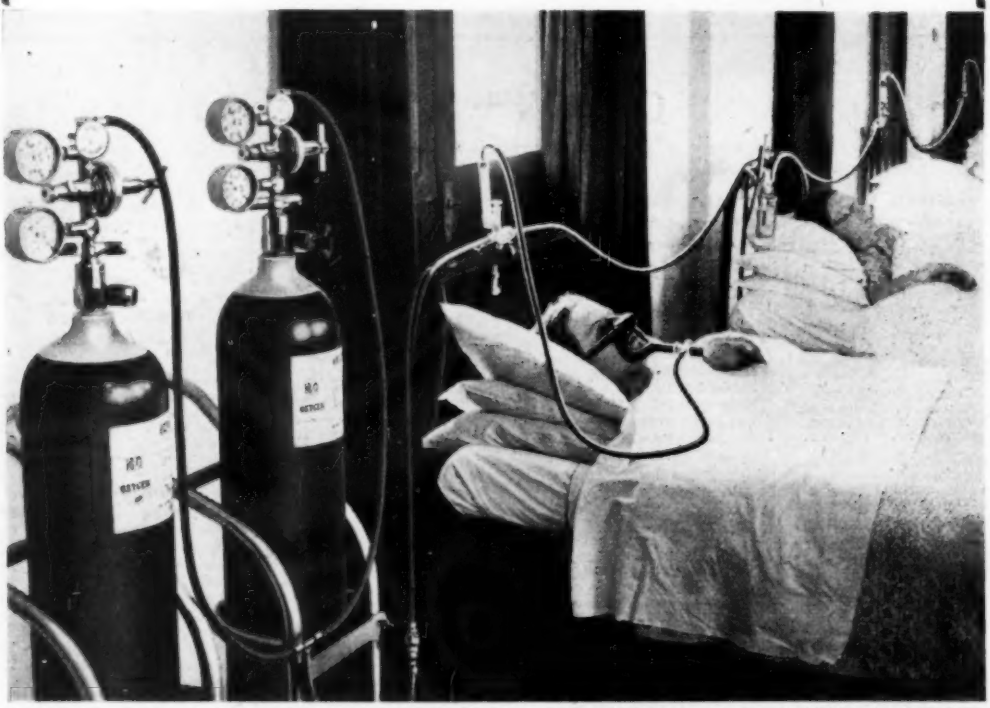

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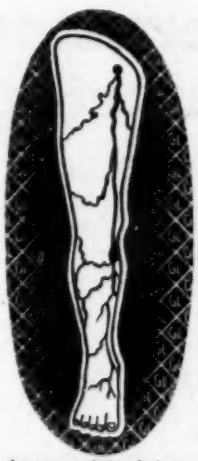

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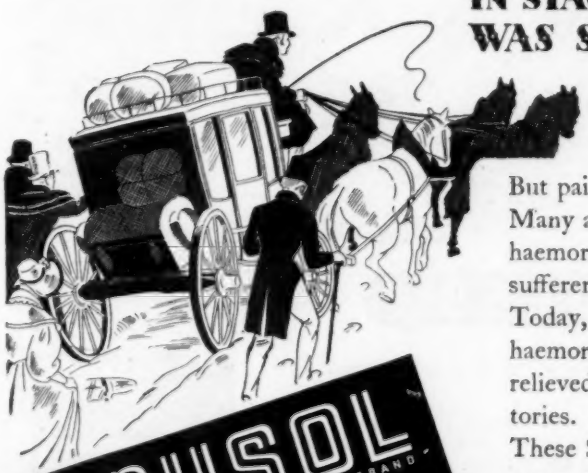

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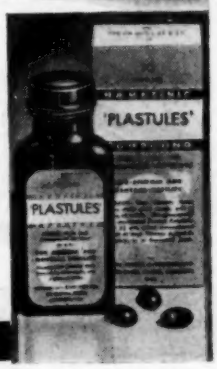

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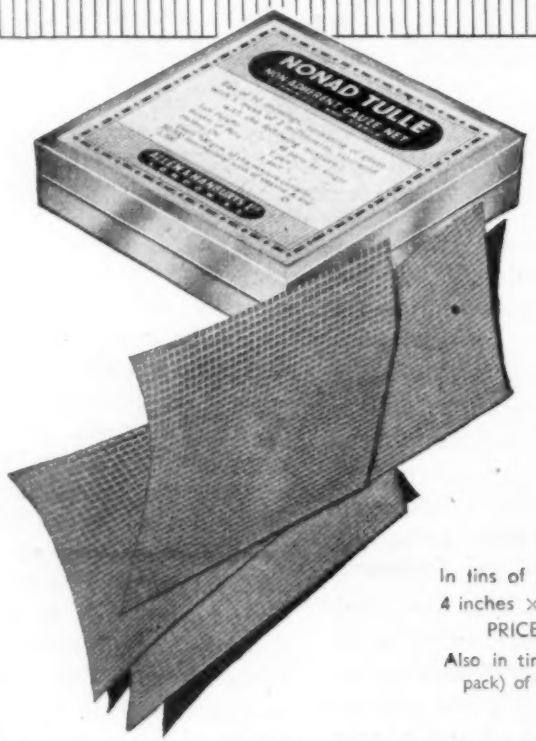

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CLINICAL, HISTOLOGICAL AND EXPERIMENTAL OBSERVATIONS

ARTHUR ELLIS, O.B.E., M.D. TORONTO, F.R.C.P.
DIRECTOR OF THE MEDICAL UNIT AT THE LONDON HOSPITAL; PROFESSOR OF MEDICINE IN THE UNIVERSITY OF LONDON

WHEN war broke out three of us at the London Hospital were preparing for publication the results of an investigation of Bright's disease. This investigation included some 20 years of personal observation, and 10 years of combined clinical and pathological study carried on with Dr. Horace Evans and Dr. Clifford Wilson. We hope to publish the detailed results of this investigation soon; in the meantime it seems useful to present the conceptions at which we have arrived.

Much of the confusion which still exists in our knowledge of the conditions grouped under the name of Bright's disease arose from failure to study the natural history of these conditions—their mode of incidence and subsequent course to death or recovery. This is the classical method of clinical study. Unfortunately, in the case of Bright's disease, this method of approach was largely neglected and both clinicians and pathologists tended to study cross-sections of the disorders in their various stages. This did lead to the appreciation of different types of Bright's disease, but failed to bring out the course of these different disorders; with the result that different stages of the same process were sometimes regarded as different types of Bright's disease.

The first important step in clearing this confusion was the work of Allbutt (1895),† who separated the clinical entity we now recognise as benign hypertension. This was followed by the combined clinical and pathological studies of Volhard and Fahr (1914) which led to a new and more acceptable classification of Bright's disease and stimulated widespread study. There are still difficulties, concerned chiefly with our imperfect understanding of the ætiology of nephritis and hypertension; but, what is less frequently appreciated, they also arise from the close similarity, both clinical and histological, of the later stages of the various forms of Bright's disease. My purpose is to present some new conceptions based on: a study of the natural history of Bright's disease in some 600 patients observed by the same group of observers in the London Hospital; histological observations on some 200 fatal cases; and a study of experimental hypertension suggested by the clinical observations.

I. NEPHRITIS

In most cases of nephritis the onset is abrupt and often accompanied by general symptoms such as malaise, vomiting and headache, with swelling of the face and feet, and the appearance of blood in the urine; yet in many the onset is insidious, the general symptoms are inconspicuous, blood is usually absent from the urine, and the only presenting symptom is œdema which tends to be persistent. Contrary to natural expectation, the prognosis is much worse in these seemingly milder cases than in those with abrupt onset. No satisfactory explanation of this paradox has been offered, the two conditions being usually regarded as the same disease, though the term subacute or subacute parenchymatous nephritis is often applied in this country to those with insidious onset. If we study more closely the two groups of patients, we find striking differences. These are presented in table I, based on the data obtained from our observations.

The separation of two types of nephritis is, of course, not new; it was appreciation of this difference which led to such terms as parenchymatous and interstitial, hæmorrhagic and hydropigenous; but the importance of these differences has not been adequately stressed. Not only is the clinical picture different but there is an ætiological factor in the form of a previous infection almost always present in the one and almost entirely lacking in the other; while—even more striking—recovery is the rule in one and the rare exception in the other. These differences are so important as to suggest that we are observing two different disorders; and for this there is considerable histological support. I am convinced that the two groups of patients should be studied separately and not simply regarded as different stages in the same disease.

I have described the two conditions as abrupt and insidious, but it is obvious that these terms, which apply to the method of onset, are not applicable to the later stages. Nor can we speak easily of acute and subacute,

TABLE I—CLINICAL FEATURES

—	Abrupt onset	Insidious onset
General symptoms	Present	Absent
Hæmaturia ..	Present	Absent, or slight
History of previous infection ..	In 84%	In less than 5%
Œdema	Short duration	Persistent
Age of incidence	60% in first two decades	Relatively equally distributed in all decades
Recovery	82%	Less than 5%

when the conditions become chronic; in any case Volhard (1931) has already used the term subacute for one course of development in cases of abrupt onset, and his example has been widely followed. Other terms such as hæmorrhagic on the one hand and œdematous or hydropigenous on the other are equally objectionable, for either form may at some time show these manifestations. It may well be argued that anything is better than the introduction of new names in a subject already badly overloaded. After long consideration I have been so impressed with this objection that I have decided to avoid the use of new names and to speak simply of type 1 nephritis for the form with abrupt onset, and type 2 nephritis for that with insidious onset.

Type 1 Nephritis

A series of 225 cases of type 1 nephritis were seen within 2 months of the onset; 173 of these had less than 2 weeks' history and the description of the acute stages of the disease has been drawn from this latter group. This type is mainly a disease of children and young adults; in our series 101 cases (60%) fall within the first

TABLE II—AGE-INCIDENCE

Age at onset (yr.)	No. of cases	
	Type 1	Type 2
1–10	46	8
11–20	55	35
21–30	32	34
31–40	26	22
41–50	11	26
51–60	3	15
Over 60	..	5
Total ..	173	145

two decades (table II). The disease may however occur at any age; the youngest in our series was 3 months, the oldest 57 years. The series comprises 105 males and 68 females (roughly 3 males to 2 females). It is probable that selection is a factor in this apparent inequality of sex-incidence.

A history of preceding infection was recorded in 145 cases (84%) of our series. Since a history of a preceding infection is often missed unless directly asked for, the incidence is probably even higher. The nature of the infection and the interval which elapsed before the onset of symptoms of nephritis are shown in table III; 122 cases (84%) fall into the group tonsillitis, sore throat,

* The first Croonian lecture for 1941; not delivered owing to the war.
† References will be found at the end of lecture 3.

cold or "influenza." The interval between the infection and onset of nephritic symptoms falls within seven and twenty-one days in 76% of the cases. No cases of post-scarlatinal nephritis are included in this series.

CLINICAL PICTURE

The onset is abrupt, with malaise, and swelling in the face and feet usually first noted on rising. Headache is common but is not usually severe; in children vomiting is often present. There may be abdominal pain, usually associated with backache and pain in the loins. Slight shortness of breath may be complained of, or is frequently admitted by adults on direct questioning. A history of passing bloody urine was obtained in about half our patients, but hæmaturia of some degree can be *demonstrated* in almost every case. There is often some pallor of the skin, but the patient may be flushed and febrile from some residuum of the previous infection. Œdema is one of the most constant manifestations, and was present in 90% of our cases. It is usually moderate in extent and severity compared with the extensive œdema of type 2 nephritis, and tends to occur chiefly in the face, back and legs. Occasionally œdema may be so slight that it is difficult to demonstrate, or it may even be entirely lacking. With rest in bed all trace of swelling usually disappears within a week. A moderate degree of hypertension is common and severe hypertension can occur; 20 patients in our series (11%) had a systolic pressure above 180 mm. Hg.

TABLE III—PRECEDING INFECTION IN TYPE I NEPHRITIS

Nature of infection	No. of cases	Interval (days)	No. of cases
Sore throat	85	0– 7	39
Cold	21	8–14	54
Influenza	16	15–21	28
Otitis media	7	over 21	16
Pneumonia	6	uncertain	8
Impetigo, appendicitis, measles, chicken-pox, skin infections	10	..	..

LABORATORY INVESTIGATION

Urine.—A quarter of the cases showed some degree of oliguria on admission. During the first week in hospital large volumes are more common owing to diuresis with elimination of œdema fluid. Over the whole series urinary output during the first week appears to be largely independent of fluid intake—that is, restriction of fluid intake leads to more rapid disappearance of œdema. When diuresis is occurring the specific gravity is low; with oliguria it is often high, partly owing to the large amounts of albumin present. In 3 cases oliguria was associated with a fixed specific gravity, but usually the readings were between 1015 and 1025, which in the presence of large amounts of albumin probably indicates some loss of concentrating power. Albumin is commonly present in larger amounts than can be accounted for by the blood present; thus, in a third of the cases over a half volume was present on boiling in faintly acid solution. A faintly smoky colour of the albumin is a useful indication of the presence of a trace of blood. Blood was visible to the naked eye in 66% of the cases, a positive guaiac reaction in 80%, and microscopic blood in 99%. The urinary deposit commonly contains many red cells and leucocytes, the latter often in sufficient numbers to lead to a report of pus. Hyaline and granular casts are usually present. Culture is usually sterile.

Renal-function tests.—Nitrogen retention is a common finding in early stages of type 1 nephritis. In this series the blood-urea was over 50 mg. per 100 c.cm. in 58 out of 160 (36% of cases) and over 100 mg. in 31 (20%); the highest value was 376 mg. As a rule the high blood-urea is attributable to extrarenal causes, such as vomiting or heart failure, and the concentration tests are within normal limits; 15% of all cases had impaired concentration tests and in roughly half of these the blood-urea was over 50 mg. It is in this type of case that the patient may die from uræmia in the acute stage of the disease.

Blood.—Some degree of anæmia is common in the early stages. In a third of the cases the hæmoglobin was below 70% and the red-cell count below 4½ million on admission. The white-cell count is usually normal unless the preceding infection is still active. The plasma proteins are often diminished and gross reduction is not uncommon. Of 55 cases in which plasma-protein estimations were made on admission the level was below 6% in 33.

COMPLICATIONS

The common complications are, infection, acute heart-failure and hypertensive encephalopathy. There may be either a preceding infection which has failed to clear up, or a complication such as bronchopneumonia or streptococcal peritonitis, occurring in the course of the disease. Acute rheumatic manifestations were present in 7 cases, in 2 of which rheumatic endocarditis was found at autopsy.

The occurrence of acute heart-failure in acute nephritis is now well recognised. It was first described by Goodhart (1879) of Guy's Hospital. In our 173 cases, signs of cardiac impairment were detected in 37 (21%). The failure was severe in 16 (9%); it was the immediate cause of death in 4 cases and was a contributory factor in a further 6. Heart-failure usually arises in the first 2 weeks of the disease, but it may come on at any time in cases which run a protracted course. The picture is that of left ventricular failure with pulmonary œdema; it is, possibly due to involvement of the myocardial vessels in the widespread vascular disorder which we believe to be characteristic of this type of nephritis.

Hypertensive encephalopathy occurs only in patients with hypertension. The symptoms, which are usually of sudden onset, include convulsions, mental excitement, blindness, and transient palsies. The symptoms are attributed to spasm of the cerebral vessels, but we have been unable to observe spasm of the retinal vessels in any of our cases. Hypertensive encephalopathy was present in 11 of our patients (6·4%) in the acute stage, and had little or no effect on the ultimate prognosis. Increased intracranial pressure is not commonly present in hypertensive encephalopathy when this occurs in the acute stage of nephritis.

SUBSEQUENT COURSE

In our experience there are four courses which the disease may take: (1) recovery; (2) death in the acute stage; (3) a rapidly progressive course with persistence of symptoms and a fatal issue within a period of months; and (4) recovery from the acute manifestations but persisting albuminuria, the patients dying many years

LEGENDS TO ILLUSTRATIONS

TYPE I NEPHRITIS

FIG. 1—Type 1 nephritis. Death in acute stage; 3 weeks' duration. Glomerulus showing necrosis and increased cellularity of tuft with acute fibrinoid necrosis of and proliferation round afferent arteriole. (× 170.)

FIG. 2—Type 1 nephritis. Rapidly progressive course; 4½ months' duration. Glomerulus showing epithelial crescent formation and necrosis of afferent arteriole. (× 245.)

FIG. 3—Type 1 nephritis. Slowly progressive course; 16 years' duration. Chronic glomerular lesion of "hypertensive" type, showing loss of lobulation, increased cellularity and capsular adhesions. Organising necrosis of afferent arteriole. (× 170.)

FIG. 4—Type 1 nephritis. Slowly progressive course; 7 years' duration. Low-power view of kidney showing focal fibrosis with alternating areas of tubular dilatation; great reduction in number of glomeruli. (× 36.)

TYPE II NEPHRITIS

FIG. 5—Type 2 nephritis; 12 weeks' duration. B.P. 155/90 mm. Hg, persistent hæmaturia. Glomerulus showing focal proliferative glomerulitis with adhesion. Clinically "nephritis," histologically "nephrosis." (× 170.)

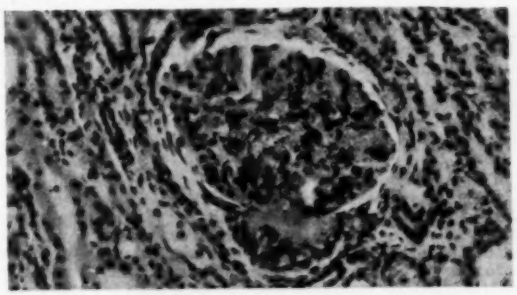
FIG. 6—Type 2 nephritis; 2 years' duration. Death from intercurrent infection. Glomerulus showing proliferative glomerulitis with tendency to increased lobulation and thickening of capillary basement membrane. (× 170.)

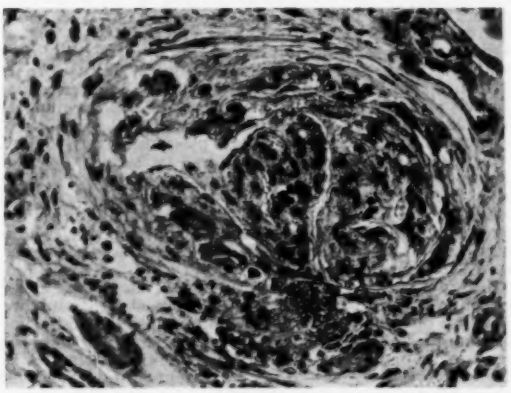
FIG. 7—Type 2 nephritis; 3½ years' duration. Death in uræmia. Glomerulus showing fully developed picture of hyalinisation of intercapillary stroma and accentuated lobulation of tuft. (× 170.)

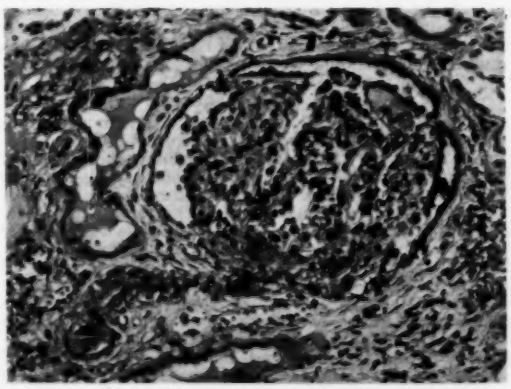
FIG. 8—Type 2 nephritis; 9 years' duration. Low-power view of kidney showing diffuse fibrosis with large number of remaining glomeruli progressing uniformly to complete hyalinisation. (× 36.)

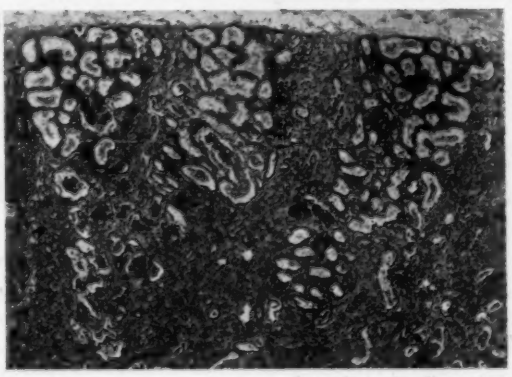
TYPE I NEPHRITIS

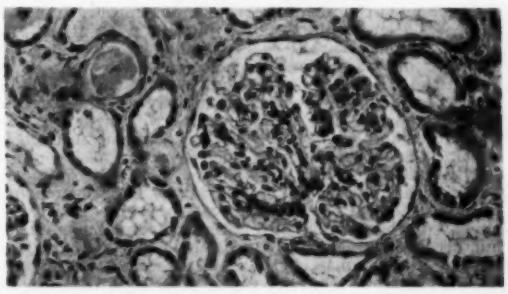
TYPE II NEPHRITIS

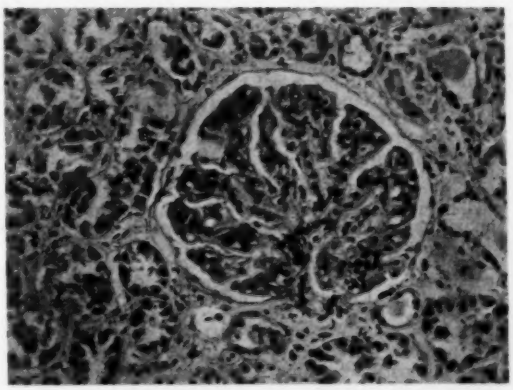


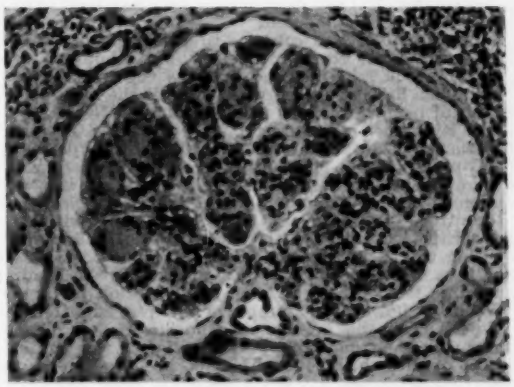


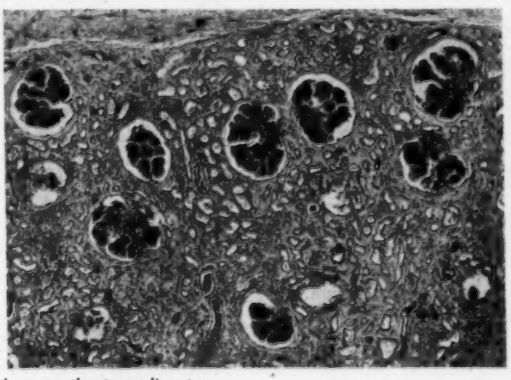












Legends to the illustrations are given on the preceding page

or even decades later with hypertension, renal failure and contracted kidneys.

Recovery is the normal course. It occurred in 82% of the cases seen within the first fourteen days of the onset of the disease. In 131 cases with a history of less than a week on admission the recovery-rate was 88·5%. When the patient is put to bed, kept warm and given a restricted diet, improvement usually begins at once. Pitting œdema usually disappears within seven days, but diuresis and weight loss often continue for another week. The hypertension usually diminishes more slowly, but as a rule the blood-pressure is within normal limits within the first fourteen days. Gross hæmaturia, as indicated by the guaiac reaction, has usually disappeared when the blood-pressure becomes normal, but microscopic hæmaturia may persist for another week or more. Albuminuria is still more persistent, but in cases that are going to recover a rapid reduction in the amount occurs during the first seven to ten days; a cloud of albumin may persist for several weeks or even months before eventually disappearing. In our experience these recoveries are complete. Albumin disappears from the urine and the patient shows no more tendency to hypertension or to further renal trouble than normal people. On the other hand persistent albuminuria, if not orthostatic, is in our opinion always an indication that the disease is progressive.

Death in the acute stage occurred in 7 cases (4%) of our series. In 3 it was due to the preceding infection, and and in one to acute heart-failure. The remaining 3 died in uræmia with severe oliguria, and histologically the kidneys showed intense glomerular and arteriolar lesions.

Rapidly progressive course.—In these cases the œdema, hæmaturia and hypertension persist and indeed increase in intensity. Renal function progressively deteriorates, and without any subsidence of symptoms the patient dies with hypertension and renal failure within weeks or months from the onset of the disease. This is the subacute nephritis of Volhard, the stormy type of Löhlein. Although 23 such cases have been observed, we had only 7 examples (4%) among our cases with less than fourteen days history on admission.

Slowly progressive course.—In this type of case the patient appears to be recovering, but albumin persists in the urine and in some instances the blood-pressure remains a little above normal. This is the most chronic form of nephritis. It is the "chronische Nephritis mit sehr langsamer Verlaufsart," the "vaskular Typus" of Volhard. The patient eventually dies with hypertension and renal failure, but only after a period measured in years or even decades, during which time he is usually in good health though albumin is always present in the urine. In our series, 18 (10%) patients with acute nephritis were left with such residual albuminuria. Owing to the long duration we have not been able to observe the whole course of the disorder in this group of patients from its onset to the termination in uræmia. We have, however, a number of patients, admitted with hypertension and uræmia, in whom a history of acute nephritis occurring many years previously was obtained. Most of these had not complained of symptoms during the long interval.

We have had the opportunity of studying in the later stages one patient who had an attack of acute nephritis in the London Hospital in 1899. During the acute attack she had what was obviously hypertensive encephalopathy, and she was treated by Dr. Cecil Wall, then a house-physician, with rectal injections of hypertonic saline. This patient was seen periodically from this time until her death with hypertension and uræmia in 1938. She remained in good health, but albumin was always present in the urine. Hypertension was present on repeated examinations from 1914 until her death twenty-four years later. Apart from headaches, there is no mention of any symptoms attributable to her nephritis until six years before her death, when she began to complain of dyspnœa on exertion.

There is good reason to believe that many patients who present with albuminuria and subsequently die with uræmia and hypertension belong to this group, even though they give no history of acute nephritis. The acute attack may have been subclinical or may have been forgotten, but occasionally such patients recall the finding of albuminuria many years previously on routine examination for the Army or for life insurance. Most young adults dying with uræmia, in whom contracted kidneys are found at autopsy, belong to this group, and the histological picture is identical with that seen in the cases giving a history of a preceding acute nephritis. Such cases loom large in a clinic of Bright's disease and constitute 15% of our patients. This is due not to the commonness of this chronic course but to its very long duration.

PROGNOSIS

The four courses outlined above give a general idea of prognosis in this type of nephritis. It will be seen that 82% made a complete recovery, 4% died in the acute stage, 4% ran a rapidly progressive course to death within a period of months and 10% apparently became chronic. A good prognosis depends mainly on early treatment. If we compare cases admitted within a week of the onset with those having up to a month's history on admission, the recovery-rate falls from about 90% to 66%; and the most important factor in treatment is rest, absolute rest, reinforced by a restriction of a fluid intake to a pint of orange juice daily. Acute nephritis should be treated on the same lines as acute carditis; if this were done I am certain that the number of chronic cases would diminish.

Suppression of urine is a bad prognostic sign: first, because cases showing it may have particularly severe lesions in the kidney; secondly because there is danger of a vicious circle, consisting of nitrogen retention, vomiting and dehydration, leading to oliguria and further (extrarenal) nitrogen retention, which I think may prove fatal in cases which might well have recovered from the renal lesion.

Severe preceding infection and heart-failure are among the chief causes of death in the early stages, and are therefore obvious factors affecting prognosis. Persistence of the hypertension, hæmaturia and œdema are ominous signs of impending chronicity and indicate that it is vital to persist with rigorous treatment. We have seen patients recover when hypertension and hæmaturia have persisted for over two months. Finally, persistence of albuminuria after acute nephritis does not necessarily indicate a chronic course, for in many instances such albuminuria is shown to be orthostatic.

ACUTE FOCAL NEPHRITIS

A small group of patients present with hæmaturia but without the hypertension and œdema found in acute type 1 nephritis. Moreover their hæmaturia occurs at the height of an acute infection, such as tonsillitis or otitis media, instead of after an interval of a week or more. Volhard and Fahr applied the term acute focal nephritis to this condition. The prognosis is good and the patient usually recovers as soon as the acute infection clears up. Occasionally there are repeated attacks of hæmaturia associated with recurrence of the acute infection; there were such recurrences in 11 out of 35 cases in our series. In 2 patients albuminuria persisted between the attacks, and after many years the blood-pressure gradually rose and death occurred in renal failure. We have not included these 35 cases in the group of type 1 nephritis.

SUMMARY

Type 1 nephritis is a disease of abrupt onset; as a rule there is a history of preceding infection, and hæmaturia is nearly always present. Most cases recover completely if adequately treated, but death may occur in the acute stage, or the disease may run a rapidly progressive course to death in a period of months. In other instances the acute manifestations subside but a persistent albuminuria remains and the patient dies with hypertension and uræmia decades after the acute attack.

Type 2 Nephritis

Since type 1 nephritis is an acute disease from which recovery is the rule it is not surprising that 80% of our patients with this condition were seen within ten days of the onset of their illness. Type 2 nephritis, on the other hand, is a disease of insidious onset in which the symptoms are persistent and recovery exceptional. In such circumstances it is obvious that a much smaller

proportion of cases will be seen early in the disease. Thus of 145 cases of type 2 nephritis studied, only 45 (31%) were seen within a month of the onset of œdema. Our description of the onset and early stages of the condition is drawn from these cases. It must be emphasised that although in this series the ratio of type 1 to type 2 nephritis is 3:2 this does not accurately reflect the relative incidence of the two conditions. Type 1 is much more common than type 2 nephritis, the apparent frequency of the latter in this series being due to its chronicity, and to selective hospital admission. Many cases of type 1 nephritis are not admitted to any hospital whereas most cases of type 2 nephritis seek admission to hospital at some stage in their illness and will do so in greater numbers to a hospital in which there is known to be a clinic specially dealing with Bright's disease.

The problem of nephrosis must be discussed before we pass to a consideration of type 2 nephritis. This term was suggested by Friedrich Müller to indicate "degenerative" lesions of the kidney as opposed to the "inflammatory" lesions of nephritis. It is used by pathologists for a number of different conditions which have in common tubular degeneration. It has, however, also been used in a more narrow sense, sometimes with a prefix such as "lipoid" or "chronic," for those cases with œdema and gross albuminuria in which hæmaturia, hypertension and impaired renal function are absent during life and inflammatory changes in the kidney are lacking or slight at autopsy. I do not think that this conception of nephrosis as a separate entity is justified. In our experience if the patient with so-called "nephrosis" does not die in the early stages and does not recover, he ultimately becomes indistinguishable from a patient with type 2 nephritis. Again, if we examine cases dying in the early stages there is a steady gradation in the histological picture from so-called nephrosis to type 2 nephritis. Moreover, some cases which are clinically nephrosis show the histological changes of Iype 2 nephritis, while conversely some patients whom we should recognise clinically as type 2 nephritis during life are found at autopsy to have the histological picture of nephrosis. tn my opinion, the essential differentiation is not between nephrosis and nephritis, but between type 1 and type 2 nephritis; and if the separation is made at this point the cases of so-called nephrosis fall naturally into place with other examples of type 2 nephritis. Included in our series of type 2 nephritis are therefore some 12 cases which on both clinical and histological grounds would be called nephrosis by many observers.

The age-distribution of type 2 nephritis, at the onset of œdema, is shown in table II. Although half the cases occur between the ages of 10 and 30, the remainder are scattered throughout the whole age-period. It is notable that a third of our patients were over 40. The age-distribution is notably different to that of type 1 nephritis, which is preponderantly a disease of children and young adults. Males and females were roughly equal in number in the cases seen within a month of the onset. In those first seen in the chronic stage (with more than a year's history of œdema) females exceeded males in a ratio of 4:1, which would suggest that a slowly progressive course is more common in women.

A history of preceding infection was obtained in only 3 of the 45 cases seen within the first month after onset of œdema, and in these its relationship to the onset of the nephritis was doubtful, the interval in 2 of the 3 being six weeks and two months. This is in striking contrast to type 1 nephritis in which a history of preceding infection was obtained in 84% of cases. It is possible that the absence of history of preceding infection is explained by the interval between the onset of the disease and the appearance of symptoms; but the whole course of the disease is so different from that of type 1 nephritis that its different origin can hardly be doubted.

CLINICAL PICTURE

The onset is insidious. Swelling is the first and often the only symptom. It is usually first noticed in the feet but may be very extensive; unlike the œdema of type 1 nephritis, which normally disappears in a few days, it is persistent. Although œdema is the presenting symptom, and is nearly always the cause of the patient consulting the doctor, it does not necessarily indicate the real onset of the disease; there is probably always preceding albuminuria, and the evidence available suggests that this may be of long standing. We have 9 examples of type 2 nephritis in which examination of the urine happened to be made before the onset of the œdema; in these albumin was found in the urine five years, three years, one year (2 cases), six months, four months and one month (2 cases) before the occurrence of œdema. Œdema then is the outstanding symptom of type 2 nephritis. Other symptoms which may sometimes be present in the early stage are shortness of breath, "bilious attacks," lassitude and weakness, backache, frothy urine and oliguria; hæmaturia is only rarely noticed.

On examination there is often gross œdema which tends to be generalised; effusions into the serous cavities were present in 17 of the 45 early cases. Owing to the œdema the patient may appear pale and plump though anæmia is not usually present, and in spite of the apparent plumpness wasting is common and may be severe. The skin is often dry and may show loss of normal elasticity. The blood-pressure was normal in 11 of the early cases; in the remainder it was raised, the systolic pressure being over 140 mm. Hg in 27, and in 6 of these over 170 mm.

This clinical picture is distinctive, and it must be emphasised that the onset was never preceded by an attack of acute nephritis. It is true that acute (type 1) nephritis occasionally runs a rapidly progressive course with persistent œdema which may be gross (the subacute nephritis of Volhard) but there is no mistaking the clinical difference in these cases; if they die the histological picture is also characteristic and in our experience quite different from that of type 2 nephritis.

LABORATORY INVESTIGATIONS

Urine.—Oliguria is common, and unless an active diuresis with loss of œdema fluid is occurring the daily volume is usually small. The specific gravity of the urine tends to be high, owing to the oliguria and the large content of albumin which is a characteristic feature of this type of nephritis. The daily excretion of albumin may be 25–30 g. Visible hæmaturia is rare and the guaiac reaction was positive in the urine in only a third of our cases at the onset. The urinary deposit usually shows red cells, leucocytes, hyaline and granular casts.

Renal function is commonly normal when these patients are first seen but there may be oliguria with extrarenal nitrogen retention. Occasional cases show renal impairment within one to two months of the onset; these are severe cases which run a rapidly progressive course.

Blood.—The plasma proteins are always reduced and are usually less than 5%. Blood-cholesterol is much increased. The blood-count is often normal in the early stages, but a slight anæmia—Hb. 80–90%, with 4–4½ million red cells—was present in about half the cases.

COMPLICATIONS

Infections are common and often cause death. They may arise at any stage of the disease but are particularly common in the early stages. Pleurisy and peritonitis were noted in 8 of our patients and bronchopneumonia in 4; empyema, septicæmia and miliary tuberculosis also occurred. Acute heart-failure and hypertensive encephalopathy do not occur in the early stage of type 2 nephritis. An interesting observation is a massive diuresis with disappearance of œdema and great diminution of albuminuria following an acute infection; we have seen 4 instances of this following empyema, pneumonia, chicken-pox and cellulitis of the leg.

SUBSEQUENT COURSE

The course of type 2 nephritis contrasts with that of type 1 nephritis, where four distinct courses were recognised, distinct not only clinically but in their pathological processes. In type 2 nephritis there is in effect only one course, that of steadily progressive renal destruction, with a remarkably uniform pathological picture. We can recognise minor variations in the intensity and therefore in the duration of the disorder, but in all there is a steady progress to renal failure unless the course is cut short by some intercurrent infection.

We have seen only 5 examples of recovery from this condition among the 145 cases we have studied. In 3 of these no hypertension was recorded; in a fourth albuminuria and œdema disappeared but the patient died later from another cause and well-marked chronic changes were found in the glomeruli. Owing to the

insidious onset of the disorder and the varying duration of the disease at the time of admission this recovery-rate cannot be expressed statistically, since there is no large group of cases seen early in the disease from which such an estimate could be made. It is clear however that recovery is exceptional, in striking contrast to type 1 nephritis where the recovery-rate in cases seen within fourteen days of the onset was 82%.

The usual course, then, of type 2 nephritis is continuous and progressive, and some degree of œdema usually remains for months or years. The patient may die from intercurrent infection at any time, but if this does not happen the blood-pressure, which may or may not have been previously elevated, eventually shows a sharp rise; fixation of specific gravity of the urine and other indications of renal failure become manifest and the patient dies in uræmia, usually with associated anæmia and hypertensive retinitis. As the blood-pressure rises the œdema often disappears. The rate of this downward progress varies from a few months to many years. Out of 60 fatal cases 38 died from uræmia and 22 from intercurrent infection or other causes. Of the 38 cases dying from uræmia the duration was less than a year in 5 and between one and five years in 21. In 11 the duration was between five and ten years and it was over ten years in 1 only. On the other hand we have 6 patients under observation in whom the disease has been present for more than ten years, and in 4 of these the duration is over twenty years.

The best indication of the probable rate of progress in the individual case is furnished by the blood-pressure. In the early stages this may be high, moderately high, slightly raised or normal. In the cases in which the pressure is high in the early stages the course is relatively rapidly progressive to death in renal failure within one to five years of the onset; œdema is persistent or recurrent, but usually disappears (apart from terminal heart-failure) in the late stages as renal insufficiency develops; renal function is often impaired from the start and gradually deteriorates. Sooner or later there is a well-marked terminal rise of blood-pressure—for example, 250/140 mm. Hg with hypertensive retinitis consisting of papillœdema, hæmorrhages and exudates. Death in uræmia follows in a few months. The cases in which the blood-pressure is moderately high may follow a similar but relatively slower course. Alternatively the blood-pressure may return to normal and these cases tend to run a chronic course such as is commonly seen in the next group. Cases with slightly raised or normal blood-pressure continue to pass large quantities of albumin in the urine for many years; œdema may persist throughout or the legs may swell at intervals; eventually the blood-pressure rises, renal impairment develops and the patient dies with hypertension and uræmia. In some cases with normal blood-pressure in the early stages, œdema tends to be extreme and the patient often dies from intercurrent infection. This is the type of case that would be called nephrosis by many observers. If death or recovery does not occur in the early stages these cases too run a progressive course and in our experience eventually die with hypertension and uræmia.

SUMMARY

Type 2 nephritis is a disease of insidious onset characterised by generalised œdema and gross albuminuria. There is no definite relation to a preceding infection, and hæmaturia is slight or absent. Recovery is rare, the course of the disease being steadily progressive. Œdema is persistent or recurrent, and secondary infections common, being the cause of death in a considerable proportion of cases. In the remainder there is progressive renal failure with hypertension which commonly leads to hypertensive retinitis as a terminal event. The duration varies from months to years and bears a definite relation to the degree of hypertension present in the early stages.

Histological Findings ‡

TYPE 1 NEPHRITIS

When the patient dies in the first few days after the onset the main lesion is an increased cellularity of the glomeruli with some polymorphonuclear infiltration, and both polymorphonuclear leucocytes and red cells appear in Bowman's space and in the tubules. In more severe cases, particularly those dying with suppression after one or two weeks, acute fibrinoid necrosis of the arterioles and of the glomerular tufts is characteristic (fig. 1) and early epithelial crescent formation may be seen.

When death occurs after the rapidly progressive course, the outstanding feature is the formation of large epithelial crescents with associated hæmorrhage into Bowman's space; acute fibrinoid necrosis of arterioles is common (fig. 2) and a few cases show an intense inflammatory infiltration of the interstitial tissue with "explosive" lesions of the glomeruli and definite peri-glomerular inflammatory reaction; hyaline droplet degeneration of the tubular epithelium is present in this group. After a duration of a year or more, interstitial fibrosis and moderate dilatation of the remaining tubules are found and the epithelial crescents have become organised with obliteration of the capsular space.

When the disease follows the slowly progressive course the histological picture is distinctive (fig. 4). The normal renal architecture is destroyed, interstitial fibrosis is severe and has a typically focal distribution with islands of dilated tubules in the intervening areas. The glomeruli are greatly reduced in number—an important distinction from malignant hypertension—and although a minority may appear normal the majority are diseased. In particular they show little or no vestige of the original nephritis but a combination of acute and chronic lesions which appear to be hypertensive in origin. The acute lesions resemble those described in malignant hypertension and are usually accompanied by acute fibrinoid lesions of the afferent arterioles. The chronic lesions (fig. 3) include enlargement, with increased cellularity of the glomerulus, loss of lobulation of the tuft, and extensive capsular adhesions; pericapsular fibrosis may be seen and the afferent arterioles are often thickened and tortuous with hyaline degeneration of their walls, perivascular fibrosis, and narrowing of the lumen. Larger arteries such as the interlobulars show endarteritis, often with a slight degree of elastic hyperplasia of the intima. This is the picture which Russell (1929) aptly termed "nephritis acris repens." As I have pointed out the condition may progress insidiously for thirty to forty years and for this reason gross renal contraction is the rule in these cases.

In brief, the histological picture in type 1 nephritis is, in its early stages, a diffuse lesion of the glomeruli with acute necrosis of the afferent arterioles as a prominent feature. In the late stages the vascular (hypertensive) process with its characteristic focal distribution dominates the picture and there may be little or no evidence of the early lesions.

TYPE 2 NEPHRITIS

The difficulty of observing cases of type 2 nephritis early, and of accurately timing the onset of the disorder, makes it impossible to describe the histological picture of the early stages with the same assurance as in type 1. Thus we have no cases dying within a month of the onset, 4 within two months and 6 within three months. In 3 of these the blood-pressure was normal and hæmaturia and renal impairment were absent, so that these cases correspond to the picture of "nephrosis"; and histologically they showed the changes described under this term—occasional bland focal necroses of the glomeruli with capsular adhesions (fig. 5) and fatty degeneration of the tubular epithelium. In the remaining 7 early cases, hypertension or hæmaturia or both were present, and the histological picture was again that described as nephrosis, except that in several instances there was a slight proliferative glomerulitis with a tendency to increased lobulation of the tufts (fig. 6). With a rather longer duration this proliferative glomerulitis with accentuated lobulation becomes more definite, leading finally to a characteristic picture (fig. 7) in the large group dying with hypertension and uræmia within five years of the onset. The glomeruli are enlarged and show a uniform lesion, the most striking feature of which is focal deposition of hyaline material at the centre of the lobules of the glomerular tuft. The appearance may resemble amyloid degeneration but it does not give the stain for amyloid. In the typical case this hyaline material appears to be deposited in the

‡ A full account of the histological findings in our series will be published later. Only the main features are given here, with special reference to the course of the disorders.

intercapillary stroma and can often be seen branching out from the hilum. In other cases the hyaline change affects the capillary basement membranes and then appears more diffuse throughout the glomerulus. Sometimes both intercapillary and basement-membrane hyalinisation are present in the same case. Occasionally hyaline thickening of the basement membrane may appear without the usual proliferative glomerulitis and accentuated lobulation of the tufts. In still more chronic cases there is a more advanced degree of the glomerular hyalinisation. The renal lesion (fig. 8) remains diffuse, the glomeruli slowly become completely hyalinised at a remarkably uniform rate, so that even when death occurs after some ten years the kidney shows no gross contraction and there is not the great reduction in number of glomeruli which is characteristic of type 1 nephritis in the late stages. Vascular and glomerular lesions of the hypertensive type are rarely seen and interstitial fibrosis is diffuse rather than focal.

These changes are in striking contrast to those of type 1 nephritis. In the early stages the glomerular lesions are quite different and necrotic vascular lesions are absent. Of special significance is the difference in the chronic stage, for whereas in type 1 nephritis the early lesions give place to secondary hypertensive changes resulting in focal renal destruction, in chronic type 2 nephritis there is a progressive glomerular hyalinisation with diffuse renal destruction in which the hypertensive process appears to play relatively little part. I think it is justifiable to conclude that these microscopic findings support the clinical distinction I have made between type 1 and type 2 nephritis, and provide a histological counterpart of the different natural history in the two disorders.

ZINC PEROXIDE PREPARATIONS

WITH NOTES ON CLINICAL USES

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ZINC peroxide has earned a reputation in the last few years for controlling certain infections, even when other means have failed. We are indebted to Meleney and his colleagues [1-10] for displaying its capabilities, which are now established in the care of chronic burrowing ulcers, bacterial and gas gangrene, and foul infections of the mouth and neck. Tudor Edwards has used it successfully for wounds, and also for abscess of the lung; and a few others have added to the list of applications. It appears to owe its value to the liberation of atomic oxygen during contact with tissues and bacterial cells. But the action is distinctive—it is more prolonged than for many similar compounds, and much more prolonged than for hydrogen peroxide. Moreover zinc peroxide has more oxygen to offer than hydrogen peroxide, as used, reckoning in terms of available oxygen. Like hydrogen peroxide, however, the zinc compound seems as innocuous to healthy tissues as to granulations, for it does not impair the vitality of either. The twin advantages, safety and durability of action, should command a wider field of use for zinc peroxide, especially in war-time surgery, for they are among the hallmarks of desirable antiseptics.

Early writers refer to zinc peroxide as applied in the forms of powder, lotion, ointment or pencil, without giving detail of any pharmaceutical value. Meleney uses a sterile suspension ready made to the consistency of 40% cream with an equal quantity of water; and he refers also to single trials of a suspension in 1% gelatin and in 5% pyrophosphate solution.[1] Application is by instillation or on gauze protected from evaporation by overlying paraffined gauze. Such preparations are easy to handle in open lesions which are free of access; but they do not keep, so have to be freshly made, an obvious drawback in a busy ward. Also the peroxide itself, and the oxide and hydroxide which it forms, congeal quickly as large flakes or concretions difficult to remove without pain from the depths of a wound, a point noted already by Meleney and others. Moreover the formation of this deposit limits the continuous action of the peroxide, and thus may well cancel its most important asset. Tudor Edwards (personal communication) uses a 10% ointment in unbleached soft paraffin; at body temperature this liquefies sufficiently to fill the crannies of an abscess, and since it does not cake it is an excellent preparation; but even so the viscosity is high enough to make removal difficult before re-dressing unless approach is easy, and it is troublesome to insert into a narrow track.

Such disadvantages preclude these preparations from use in remote places or those with cramped access. The object of this paper is to describe a number of alternative ways of using zinc peroxide which were devised in the first place for treating infected war wounds, residual empyema cavities and secondarily infected wounds after thoracoplasty. Suitable preparations need to be uniform and stable, both chemically and pharmaceutically, retaining these properties over common ranges of temperature and for a reasonable time. They ought to compare favourably with earlier preparations in liberating active oxygen when in contact with tissues. Their viscosity should allow of easy flow through needles and small tubes; and any vehicle must be innocuous, readily obtainable, easily sterilised and preferably cheap; and so must any suspending agent.

GENERAL PROPERTIES

Zinc peroxide has long been a familiar commercial product. Market varieties, under trade names, contain diverse proportions of actual peroxide, with a maximum of 55%, mixed with the ordinary oxide, hydroxide and carbonate. This form is a white, somewhat gritty powder, soluble in water only to the extent of 1 in 45,000. The simple formula for the peroxide, ZnO_2, is probably correct, although critics have put forward alternative and more complex structures. One difficulty in accepting a simple formula is to account for variations in certain physical constants—thermal stability, for instance, is reported to range from 50° C. to 170° C. No doubt this depends on the state of aggregation, but any variability does not matter pharmaceutically because sterilisation by heat is impracticable unless done with an elaborate laboratory technique.

For medicinal purposes zinc peroxide should conform to the BP standards for zinc oxide in regard to metallic zinc and foreign elements; the arsenic limit of 10 parts per million is the most important, and is safe enough. Actually, tested samples have shown much less. In this work a compound was used containing 38–40% of actual zinc peroxide, a standard product easily obtainable in this country. Under ordinary conditions we found that deterioration of this compound is not more than 1% over three months in terms of absolute peroxide. Control assay is thus desirable only after long storage. Although zinc peroxide is a powerful oxidising agent it remains chemically active and stable in contact with ordinary hydrocarbons of the paraffin type. Stability with vegetable oils needed investigation, and also stability when ionic conditions are present. These three categories covered the vehicles most favourable for pharmaceutical use, and they formed a convenient starting-point for the present investigations.

OINTMENTS

Ointments of zinc peroxide can be made over a wide range of strengths in absolute peroxide, but 2–10% are convenient and suitable for external application. Made with either the yellow or white soft paraffins of the BP as the base they remain stable and active for lengthy periods. There is no deterioration within six days as shown by initial assays, and hardly any loss up to several weeks, the period covered by present tests. No difference in stability was found between the two varieties of soft paraffin. Later investigations showed that the peroxide is quite indifferent to hydrocarbons in general.

Zinc peroxide *	10
White soft paraffin to	100

Sterilise the white soft paraffin by heating for an hour at 150° C. in a hot-air oven. Cool to normal temperature. Remelt the white soft paraffin at a temperature not exceeding 50° C. Incorporate the zinc peroxide by sifting it through sterile muslin into the melted paraffin under aseptic conditions. Store in sterile containers.

* In all cases the proportions of zinc peroxide are in terms of absolute ZnO_2.

SUSPENSIONS

Water or saline solutions are unsuitable vehicles for zinc-peroxide suspensions, excepting for emergency use, because sedimentation is almost immediate and decomposition rapid. Stable suspensions can be made, however, either with a vegetable oil or with liquid paraffin; but in each case a suspending agent is needed to avoid flocculation, which otherwise occurs within a few hours. The traditional agents of pharmacy were tried, but they proved unsuited for a variety of reasons. Trihydroxytriethylamine, now widely used in the cosmetic industry, was also tried, but it was unsatisfactory in concentrations below 1%, and higher figures were not regarded as safe for use on raw surfaces.[11] Eventually we found that glyceryl monostearate, one of the newer emulsifiers, gave satisfactory results. For the particular purpose of acting as a suspending agent in a vegetable oil this substance has the advantage of close chemical relationship with the ordinary fatty glycerides, and moreover it is harmless.

A range of vegetable oils was then tried, both individually and in combination, for making a series of experimental suspensions. Nut oil (oleum arachis, BP) proved to be the most satisfactory vehicle. Fortunately it is readily obtainable.

Zinc peroxide	10
Glyceryl monostearate ..	3
Nut oil to	100 (all by weight)

Sterilise the nut oil by heating for an hour at 150° C. in a hot-air oven. Cool to normal temperature. Add the glyceryl monostearate to the nut oil. Heat both to 130° C. for an hour. Cool to normal temperature. Incorporate the zinc peroxide with the nut oil and monostearate in a sterile mortar under aseptic conditions, sifting the zinc peroxide through sterile muslin. Store in sterile glass-stoppered bottles, capping with sterile parchment paper.

Standardised preparations made to this formula were then assayed at intervals to gauge stability. It was found that no loss of available oxygen could be detected within a month under ordinary storage conditions. After that a small loss was progressively detected, but not more than 10%, in terms of absolute zinc peroxide, over three to four months. A typical example was provided by results from three samples used in clinical trials. These were made on Feb. 13, 1941, and the residues examined on June 4, 1941, yielded respectively 9·1%, 8·2%, and 9·8% of absolute ZnO_2, a mean loss of 10% of the original content after four months. At lower temperatures this oily suspension solidifies. A quantity kept for sixteen days at 22° F. readily reliquefied at body temperature. The peroxide had remained constant. At higher temperatures there is a tendency for the peroxide to separate from the oil, but immediate recombination takes place on shaking. A quantity kept at a temperature ranging between 110° F. and 120° F. for sixteen days separated during this period, but recombined at once on slight shaking with no alteration in the physical condition of the suspension. Stored in capped stoppered bottles the loss in peroxide content under such conditions was found to be less than 5% in terms of ZnO_2, an insignificant amount from the practical point of view. These results with extremes of temperature showed that the suspension retained its character in a way that should allow its use in either cold or hot climates.

This suspension was subsequently put to a preliminary series of clinical trials extending over more than a year. Meleney and Johnson[8] mentioned that the bactericidal action of zinc peroxide is lessened in an oily suspension, but they gave no details and have made no further reference. Bacteriological studies have not been practicable during the present tests, but clinical observations have left no doubt that the action is considerable, allowing for the absence of such controls. The preparation is easy to handle, and seems about as effective therapeutically as a watery suspension or paraffin ointment: and it has advantages over both. It remains physically stable in contact with tissues, whether infected or not, and it satisfies other pharmaceutical criteria mentioned above. Evidence of any local or systemic toxicity has not been found so far. The margins of treated wounds become healthy. Infected areas soon show less tissue destruction and the appearance of healthy granulations. Necrotic debris loosens and is then more readily removed, and any foul odour quickly goes. On several occasions light packing with impregnated gauze has controlled the sepsis in a wound and thus stopped secondary hæmorrhage. When dealing with narrow sinus tracks, more particularly those from chronic empyemas in this instance, the preparation can be instilled and retained in situ as long as desired with the aid of proper posturing; or the track may be lightly packed with saturated gauze. With either technique the peroxide is easily recovered because the preparation does not adhere to the walls of the cavity, so that there is no appreciable residue to act as a foreign body or source of metallic poisoning. Recently the preparation has been poured into chronic empyemas of the localised kind with bronchial fistulæ; although on occasion the oily taste of the preparation has been noticed by such patients no evidence of bronchial irritation has appeared and no harm has resulted.

Although 10% of absolute zinc peroxide was selected for trial, stronger suspensions can be made over a wide range of strengths up to 25%. But their greater viscosity restricts their usage, and 10% is the most satisfactory. Others, with liquid paraffin as the vehicle, have been tried also; but so far they have not been more effective in treatment, and they need traces of free fatty acids incorporating, as well as glyceryl monostearate, for stabilising the suspension; 3% of anhydrous wool fat is suitable.

Zinc peroxide	10
Wool fat	3
Glyceryl monostearate ..	3
Liquid paraffin to ..	100 (all by weight)

Mix the wool fat, the glyceryl monostearate and the liquid paraffin. Heat to 150° C. for an hour in a hot-air oven. Cool to normal temperature. Incorporate the zinc peroxide with the mixture in a sterile mortar under aseptic conditions, sifting the zinc peroxide through sterile muslin. Store in sterile glass-stoppered bottles, capping with sterile parchment paper.

There is nothing to choose between nut oil and liquid paraffin suspensions as regards stability and deterioration, nor in the facility with which they can be used.

A feature of these suspensions is that other active ingredients may be incorporated if chemically compatible. For instance, scarlet red was introduced into the oil suspension in strengths up to 5%. This was used when surface epithelialisation lagged behind the previous rate of successful granulation of an infected site, prolonging the time in hospital. From a small experience so far this manœuvre has been worth while, and deserves further trial.

GELATINS

In his first paper Meleney[1] mentioned a single trial of a suspension in 1% gelatin, but he has not returned to the subject since. The possibilities of gelatin as a vehicle were considered early in these investigations, though it was not thought a promising field as the presence of water favours decomposition of zinc peroxide. In this, however, we were mistaken.

Liquid preparations.—Gelatin solutions of various strengths give stable suspensions pharmaceutically. The best is a 15% solution, and no additional suspending agent is required. At room temperature this preparation is solid, an advantage for transit: but liquefied at body heat it is of almost watery consistency, and is then easier to use than either oil or paraffin suspensions where introduction into the depths of a wound through a needle or small tube is inevitable. The disadvantage is that it flocculates much more readily than the others, and for this reason is less suitable for general purposes. Work on its chemical stability was therefore discontinued.

Zinc peroxide	10
Gelatin	15
Distilled water to	100

Dissolve the gelatin in the requisite quantity of distilled water. Filter. Sterilise the solution by the following process. Heat in steam at 100° C. for an hour on the first day. Autoclave at 110° C. for an hour on the second day. Heat in steam at 100° C. for an hour on the third day. Cool to normal temperature. Adjust the reaction of the solution to pH 8, using sterile N/1 sodium hydroxide. Warm gently. Incorporate the zinc peroxide with the gelatin solution in a sterile mortar under aseptic conditions, sifting the zinc peroxide through sterile muslin. Store in sterile glass-

stoppered bottles, capping with sterile parchment paper. Keep in refrigerator.

Solid preparations.—A series of solid gelatin preparations was made, imitations of Unna's paste. It was found possible to obtain chemically and pharmaceutically stable gelatins of this kind over a wide range of strengths of zinc peroxide. A preparation made to the formula of the official gelatinum zinci, but containing the peroxide instead of the simple oxide, gave on assay 6·5% of absolute ZnO_2. This remains chemically stable for at least a month in ordinary conditions of storage and temperature. It is, of course, like Unna's paste, unsterilised, and the present trials did not provide suitable conditions for its use.

Zinc peroxide	..	6	Glycerin	.. ..	35
Gelatin	.. ..	15	Distilled water to	..	100

The process for gelatin of zinc BP is followed, the peroxide substituting the lower oxide. (The ingredients are not sterilised.)

SUMMARY

The pharmacy of zinc peroxide has been investigated, and a number of ointments, liquid suspensions and gelatin preparations devised which are active and stable.

Ordinary paraffins are the most satisfactory vehicles for ointments, and nut oil (oleum arachis BP) for liquid suspensions.

Glyceryl monostearate is a good suspending agent for oil suspensions, and a suitable formula is 10% of absolute zinc peroxide with 3% of monostearate. Preliminary clinical trials indicate that in this form the peroxide is at least as active as in simple watery suspension; and the stability, consistency and flexibility in use are practical advantages which make it preferable.

We are indebted to surgical colleagues of one of us (C. H.) at Horton Emergency Hospital for their help, and for facilities for clinical trials; to Sister Gaffikin and her staff for their careful observations; and to the resident medical staff attached to the Chest Unit at the hospital for their coöperation. We wish to acknowledge the supplies of standardised material provided by the Laporte Chemical Co., Luton. The glyceryl monostearate was obtained from A. Boake Roberts and Co. of Stratford.

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RECOVERY FROM AGRANULOCYTOSIS AFTER A RIGOR DURING TRANSFUSION

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IT is known that if an attack of agranulocytosis is interrupted by a sudden pyrexia large numbers of granular leucocytes may appear in the blood-stream equally suddenly. Israëls and Wilkinson [1] recorded such an incident in the course of agranulocytosis due to amidopyrin. The case to be described here represents an extreme example of this phenomenon in a patient whose agranulocytosis was due to sulphapyridine and who had not responded to pentnucleotide.

An airman, aged 20, was inoculated on Aug. 18, 1941, with TAB. and ATT. On the day after inoculation he developed pyrexia with a severe local reaction, and during the next ten days he was given 42 g. of sulphapyridine by mouth. By this time he complained of tenderness of the lower gums and stiffness of the muscles of the neck, and the tonsillar glands were found to be enlarged. The total white-cell count was 2500 per c.mm. with complete absence of granular leucocytes. He was treated with intramuscular injections of pentnucleotide, 10 c.cm. twice a day, for seven days. Blood-transfusions were also given; his blood group was AB and he was given blood from group O donors, direct compatibility tests being carried out each time. After one pint of blood on Sept. 1st his total leucocyte count increased to 3500 per c.cm., with neutrophils 3%. By this time he had ulceration of the lower gums and cheek, the tonsillar glands were enlarged and painful, and he had an intermittent pyrexia, rising to about 100·2°F. After pentnucleotide for a further two days, the total white-cell count had increased to 5000, with neutrophils 6%. A second pint of blood was given on Sept. 4th and the total white-cell count increased to 8000, with neutrophils 13%. Tenderness of the glands decreased and he felt much better. On Sept. 8 a third pint of blood was given, but this had to be discontinued after half a pint had been run in because he had a severe rigor, lasting for about fifteen minutes. Blood-films taken immediately after the rigor showed a slight increase in the total white-cell count and in the percentage of neutrophils. Four hours after the rigor his temperature rose to 105·6° F. The total white-cell count was then 40,000 per c.cm. with neutrophils 85%; almost all the neutrophils were immature. Next morning his temperature came back to normal and in two days the ulceration of the gums healed completely. During the next four days his total white-cell count and the percentage of neutrophils gradually returned to normal. The neutrophils also progressively appeared more mature. He was discharged from hospital on Oct. 8, fully recovered.

There was no question of an incompatible blood-transfusion, so the cause of the pyrexia is a mystery. Nevertheless it effectively cut short the agranulocytosis, and this suggests that an artificial but controlled pyrexia, such as that produced by protein shock, if used with caution might be useful in aborting such attacks.

SUMMARY

A case of sulphapyridine agranulocytosis responded poorly to pentnucleotide.

A rigor and pyrexia produced by blood-transfusion provoked an intense granulocytosis. The patient's symptoms remitted and there was no recurrence.

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ANTHRAX SEPTICÆMIA

A FATAL CASE

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A GIRL, aged 17 years, died at her home in less than thirty-six hours from an acute illness with high temperature and severe headache. Cerebrospinal fever being prevalent at the time in the immediate locality, and in the absence of a satisfactory diagnosis, the local health department, with the somewhat tardy sanction of the Welsh Board of Health, made arrangements for an autopsy, which was carried out by Dr. J. Gough, pathologist to Cardiff Royal Infirmary. The results of this examination are summarised below.

The air-passages showed slight congestion. Each pleural cavity contained blood-stained fluid; ½ pint on the left side and ¾ pint on the right. The lungs were very congested and œdematous. The spleen was moderately enlarged; pulp very soft. Both kidneys were congested; small hæmorrhages in the pelvis of the right. The pia-arachnoid was extremely congested over the hemispheres, with subarachnoid hæmorrhage on the upper and lateral aspects and along the Sylvian fissures. There was little congestion and no hæmorrhage at the base of the brain. There was hæmorrhage into the subarachnoid space in the upper thoracic region of the spinal cord. The brain was very congested with small hæmorrhagic areas in the cerebral grey matter, thalami and other basal ganglia, and near the vermis of the cerebellum.

Microscopic examination.—The brain showed an acute hæmorrhagic inflammation of the pia-arachnoid over the hemispheres. The subjacent brain showed an acute inflammation of perivascular distribution in the grey matter. Similar inflammation was present in the basal ganglia and cerebellum. In the lungs there were hæmorrhagic areas in which the lung tissues were destroyed. The spleen was intensely congested; the pulp was infiltrated with inflammatory cells.

Bacteriological examination.—From the meninges, brain, spleen and blood a spore-bearing aerobe was grown in pure culture. The same organism, together with *Streptococcus viridans*, was grown from the lung. From the intestine only *Bacterium coli* was grown. The spore-bearing organism was pathogenic for the guineapig and mouse and identified as *Bacillus anthracis*.

Cause of death.—Septicæmia and meningo-encephalitis due to anthrax infection.

The patient had, of course, received no specific treatment for anthrax, as such was not even suspected prior to death; nor had any form of chemotherapy been instituted.

Up to ten days prior to her illness the girl had been working in a modern South Wales brush factory. Two days before ceasing her employment there she had what her parents describe as a boil on the middle phalanx of the second finger of the right hand, from the centre of which her father, who possessed some knowledge of first-aid, extracted a bristle which had entered the finger in the course of her work. The lesion subsequently healed without medical aid being called for. Her final illness began twelve days after this incident, the patient being quite well in the interval.

It was ascertained that the girl had been employed in sorting horsehair and pig bristle imported mainly from China and South America, clean overalls being regularly worn by employees in this section of the factory. Samples of material used by her were bacteriologically examined by Dr. V. D. Allison, Ministry of Health, who reported that of the seven different batches of suspected horsehair and bristle submitted three were heavily contaminated with aerobic spore-bearing organisms, and from one of these—a mixed horsehair—he succeeded in isolating a colony of typical *B. anthracis* which proved lethal to a guineapig.

DISCUSSION

According to Muir and Ritchie's "Manual of Bacteriology" (6th ed. p. 354) "cases have been recorded in which hæmorrhagic meningitis, associated with the presence of anthrax bacilli in large numbers, has occurred as a complication of various primary lesions." It is interesting to note that in the present case microscopical examination of sections from the brain showed evidence of an acute encephalitis.

It is difficult to be certain whether this was primarily a case of malignant pustule or of wool-sorter's disease. The clinical history suggests that the portal of entry of the infection was the finger, giving rise to a malignant pustule which healed spontaneously, as there was no evidence of this lesion at autopsy. It is known that the malignant-pustule form of anthrax may heal spontaneously without treatment and without producing generalised symptoms; but it is a moot point whether the local infection can heal and at the same time the anthrax bacillus gain access to the circulation and produce a generalised infection. It will be noted that almost a fortnight elapsed between the injury to the patient's finger and her final illness, and this may have been due either to a small infecting dose or to the organism being of relatively low virulence.

The post-mortem findings showed evidence of a hæmorrhagic pneumonic condition compatible with a diagnosis of wool-sorter's disease, but this may have been only part of the generalised infection. The fact that the girl had been away from the brush factory on holiday for ten days prior to her final illness is also a point against the diagnosis of primary pulmonary infection with anthrax, for the incubation period in this condition is very short, and is usually accepted as 1–3 days.

Dr. W. R. Nash, M.O.H. for Caerphilly, kindly supplied the clinical history of this case.

THE school medical service of GLASGOW suffered considerable dislocation as the result of the war, so Dr. J. Miller Young's report for 1940 gives but an incomplete picture. There were 44 new cases of corneal ulcer as against 51 in 1939, but there was no case of strumous ophthalmia against 56 in 1939. New cases of interstitial keratitis sank from 19 to 7. Scabies increased from 1995 to 2412 cases, but impetigo decreased from 5576 to 2210. An interesting return is 202 cases in 1939 and 72 in 1940 of herpes zoster. Suppurative otitis media, which gave 739 cases in 1939, produced only 348 cases in 1940. Head ringworm declined from 69 to 48 and body ringworm from 260 to 91 cases. There was a decline of 55·8% in all cases treated, but this cannot be read as a real decline in cases needing treatment, for the upset of the department interfered with inspection and detection and to a lesser extent with provision of treatment.

Medical Societies

ROYAL SOCIETY OF MEDICINE

AT a meeting of the Section of Neurology on Dec. 18, with Colonel GEORGE RIDDOCH, the president, in the chair, a discussion on

Rehabilitation after Injuries to the Central Nervous System

was opened with a paper contributed by Prof. GEOFFREY JEFFERSON, read in his absence by the president. In peace-time (he wrote) the care of patients recovering from head injuries had left much to be desired. Important difficulties had been lack of control over the conduct and welfare of the patient once he left the hospital, and deficiency in bed accommodation in first-class hospitals. The patient therefore rehabilitated himself as best he could under his doctor's supervision. In the industrial population this was a slow process. On an average, a case of head injury was not referred for specialist advice for six months, and the period was often far longer. By that time a neurosis had become firmly established. The point was that these patients were nearly all nice folk who had no business to get into the states they were in. The worst offenders were the insurance companies, who allowed cases to drag on inconclusively before asking for skilled advice. War-time conditions made waste of man-hours a serious matter. Neurologists were now trying to rehabilitate these patients in weeks instead of months. Much of the teaching had to be revised; old beliefs were being critically examined and found to be insecure, without complete certainty of the nature of their successors. Nevertheless, Professor Jefferson believed that neurologists were on the right lines. Rehabilitation might be defined as the planned attempt, under skilled direction, by the use of all available measures, to restore or improve the health, usefulness and happiness of those who had suffered an injury or were recovering from a disease. Its further object was to return them to the service of the community in the shortest time. Basically, all medical treatment had no other aim. Rehabilitation was a continuum closely interwoven throughout with the general medical care of the patient. All could and must help in the work; it did not fall within the ambit of any one man or specialty. It was planned to give the patient a sense of his own importance as an integral part of the social structure, to assure him a sense of achievement, and to give him the opportunity to discover that, in spite of his injury, he still had useful powers and his wage-earning capacity was not lost. As a national and planned effort, rehabilitation did not yet exist, and the fluid state of the hospital system made the present a favourable time for an experimental beginning on a reasonably wide scale. Such treatment should be begun as soon as the patient's condition allowed. It should include diversional and constructive occupations, hospital maintenance work, physiotherapy, and intellectual and recreational pursuits. In the first stage, which might begin when the patient was still in bed, rehabilitation might consist of reading or being read to, the solution of puzzles, drawing or colouring, needlework, knitting, or making rugs or baskets. In most cases of dysphasia, re-training of speech by a speech therapist was required. Ambulant patients might work at book-binding, string, leather or metal work, or simple carpentry. Concerts, films and dancing were already available in some centres. Patients who could not tolerate the noise should have access to an adequate silence room. A most important service of rehabilitation was the institution of a time-table by which nearly every part of the patient's day was dedicated to some pursuit. Physiotherapy should not dominate rehabilitation—it occupied a very small part of the day and was largely passive, whereas other types of occupation excited the patient's interest and coöperation. During the earliest stage its chief function would be massage and encouragement to move paretic limbs. The proper use of the psychologist was that he should report on cases of head injury in much the same way as reports were made by the radiologist or pathologist. It was important to assess the patient's character, emotional qualities, recognition of values, reactions to problems and aims in life. In more serious injuries, where some degree of traumatic dementia had occurred, the

neurologist would naturally lean on the psychologist more heavily. The effects of the operation had usually passed away in about 8 weeks, and the second stage or period of hardening then began. Military cases should then be taken over by the Service authorities to be rehabilitated in Service pursuits under discipline. Rehabilitation would henceforward include gymnastics and physical training, work in the garden and carpenter's and engineer's shops, organised games, and walks outside the grounds. Visits to shops and cinema should have the purpose of finding out how the patient reacted to crowds and traffic, and how well he could sustain visual and auditory attention. When the patient left hospital much could be done by informing him and his doctor what sort of an injury he had and what was expected of him. Speech with the wife or relatives would help to make them aware of the most important facts about head injuries and to divert them from over-solicitude. In the whole of rehabilitation, instruction of this sort took first place.

Prof. HUGH CAIRNS emphasised that the varying time factor in recovery must be taken into account in planning rehabilitation. The best yard-stick for determining the severity of a brain injury was the duration of the post-traumatic amnesia. Roughly speaking, if this lasted 5 min. to an hour the shortest time in which recovery could be expected was 4–6 weeks; if it lasted 1–24 hours recovery would take 6–8 weeks; if it lasted 1–7 days recovery would take 2–4 months; and if it lasted more than a week recovery could not be expected in under 4 months. The central disturbance was one of thinking at various levels—at lower levels there might be an impairment of speech, reading, calculation, orientation, memory or concentration; at higher levels impairment of initiative, judgment or capacity for abstract reasoning. To guide a patient satisfactorily through the stages of rehabilitation the doctor must assess his condition in terms of these functions. The question of whether he would be fit for his previous work must be answered as early as possible, and the answer would often largely depend on his retention of the capacity to learn. The unstable man would find greater difficulty in his return to work than would the stable. Observation of the man himself and systematic inquiry into his personal and family history were all-important. Almost every patient who made a full recovery from concussion suffered at a certain stage from headaches, and after a serious injury they might come on very late in convalescence. It was, however, one thing to have a headache and another to complain about it. The patient's reaction varied considerably with his emotional make-up, his anxieties and fears, his ability and desire to return to work. An unstable man would probably need special treatment if he were not to break down on return to work.

Dr. W. RUSSELL BRAIN declared that the high incidence of neurosis after injury and the continual neglect of it was a national reproach. A survey of 100 consecutive cases of head injury caused by road accidents and another 100 caused by industrial accidents showed clearly that neurosis was much commoner in the industrial cases, and in unskilled as compared with skilled workers. An industrial injury was an occupational injury, and therefore suggested to the workman that his occupation was dangerous and his economic position insecure. The legal procedure was widely different in the two groups—after a road accident the insurance system was in most cases a guarantee of compensation, but after an industrial accident the workman's claim was often contested, and the defects of the workmen's compensation law contributed to the development of neurosis. Rehabilitation should begin with the general practitioner or casualty officer who first saw the patient; these needed to learn the right psychological handling of the injured man, to avoid suggesting grave disability and hospitalising light cases. Special accommodation should exist for head-injury cases at every hospital, and some members of the staff should be trained in their treatment. Light work should be adjusted to each man's capacity. The responsibility of society for the injured should be more widely realised, and the law should be altered to remove the present disputes over sums of money and to introduce systematic rehabilitation.

Dr. LUDWIG GUTTMANN urged that rehabilitation should start immediately after the injury and the patient should be continuously treated throughout under the supervision of the same doctors. Förster's work had demonstrated the importance of systematic aftercare and a good understanding of the idea of rehabilitation. Not all peripheral nerve injuries could be immediately brought into special centres; therefore all general and military hospitals should arrange that the patient could be seen immediately by a specialist versed in the after-treatment of these lesions. An integral part of a rehabilitation service was a thorough record of all early treatment. Strengthening of synergistic muscles could be of great practical value. Electrotherapy would accelerate rehabilitation if carried out regularly, especially in cases of atrophy, and would maintain or improve the elasticity of paralysed muscles. Remedial exercise should aim at quick movements over the widest possible range.

Dr. ELIZABETH CASSON emphasised the importance of training in occupational therapy, and the provision of centres where daily treatment could be given and the orthopædic surgeon or neurologist could keep in touch with the occupational therapist. A great difficulty was the neglect of psychological training in the study of physical medicine, whereas occupational therapy, having originated in America, had a psychological basis. Students in it were trained to regard the patient as a person getting well, and to teach him so to regard himself. They were taught to apply every possible principle of ordinary psychology continuously—to exploit the patient's curiosity, herd instinct and desire to follow a leader, so that the patients in a centre were welded into an enthusiastic group, actively interested in the task of getting well. Amateurs should not engage in this work. Insurance companies should somehow be induced to realise that it would pay them heavily to maintain rehabilitation centres.

Mr. D. W. C. NORTHFIELD admitted that Professor Cairns had somewhat startled him by proposing to begin active treatment so early. He had always supposed that nearly all headaches had an organic basis and called for complete rest in bed.

Dr. H. J. EHRENWALD advocated histamine ionisation for postconcussion headaches. Patients with hysterical headaches did not respond to this treatment.

Dr. WILFRED HARRIS felt that insufficient stress had been laid on damage to the dura as a cause of headaches, and that recovery might have to be measured not in weeks or months but in years. The nerve-supply to the dura was almost entirely through the trigeminal nerve, and if an injection of procaine into the Gasserian ganglion immediately relieved the pain an injection of alcohol might permanently cure it.

Mr. WYLIE MCKISSOCK complained that in the majority of centres organisation was seriously deficient. Before proper rehabilitation was possible the necessary personnel must be enlisted. Not enough doctors were capable of supervising it, and there was need of more almoners, social workers and clerical staff.

The PRESIDENT remarked that the rehabilitation committee of the Ministry of Health had been working on this question, and the orthopædic centres had occupational therapy well organised. Similar provision was to be made for the brain-injury centres. The real difficulty was that the supply of trained medical and auxiliary personnel was not nearly large enough.

Major B. B. HICKEY commented on the great preponderance of persons of lower-grade intelligence among the patients with postconcussional syndromes.

Major H. G. GARLAND confirmed that personality might be a more important factor in prognosis than the severity of the injury—a good brain would recover from anything, but a bad brain might not recover from even a trivial injury.

The PRESIDENT reminded the meeting that, while occupational therapy might need special personnel and apparatus, its elements might be carried out quite simply. Rehabilitation was treatment as a whole: the medical staff should re-orientate their minds in the meaning of treatment and encourage their patients to coöperate in the process of recovering function, making them feel they were members of a team.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—At a meeting of this society at 17, Bloomsbury Square, London, W.C.1, on Thursday, Jan. 8, at 2.30 P.M., Prof. A. St. George Huggett, M.B., will speak on the embryo as a patient.

Reviews of Books

Dietetics for the Clinician

(4th ed.) Editor: MILTON ARLANDEN BRIDGES, M.D., F.A.C.P. London: Henry Kimpton. Pp. 960. 45*s*.

THE gap between theory and practice is probably wider in dietetics than in any other branch of medicine. This is to be explained partly by the rapid advance of nutritional knowledge and partly by our deep-rooted unconscious prejudices about food. Such books as this may help to narrow the gap. Written by some twenty American contributors it begins with a competent review of our present knowledge of nutrition. An account of the dietetic management of more than a hundred diseases follows, in which readers are advised to assess a new diet by checking it against "sound known physiologic demands"; if it fulfils these, if it is palatable and avoids monotony, and if under observation it gives a clinical response, then it is a good diet. Not all the contributors however adhere to this article of faith. For example readers are warned that dietaries commonly advocated may be lacking in essential factors, especially vitamin C; yet the diets recommended for gastric hyperacidity, typhoid and several other conditions are extremely deficient in this vitamin. Diets too are suggested which have certainly not been shown to ensure clinical response. What evidence is there that a particular diet has any effect whatever in hæmophilia, and how many clinicians would nowadays treat pernicious anæmia or simple goitre dietetically? Other queries will occur to the critical reader. Why do all the diets recommended for typhoid fever contain lactose as the only sugar? What evidence is there that glucose is activated on absorption? What exactly are the "carbohydrate deficiency diseases"? Is cretinism really unknown where sea-food is consumed? Most of the faults however could have been avoided by more adequate editing and the dietetic management of some diseases, especially those of the skin and of the gall-bladder, is described logically and usefully. The 300 pages of tables, mainly on the composition of foods, are excellent for reference.

Carcinoma of the Rectum

with special reference to its pathology and treatment. LIONEL E. C. NORBURY, M.B. Lond., F.R.C.S. London: H. K. Lewis and Co. Pp. 68. 7*s*. 6*d*.

THIS small book would make a good chapter in any volume on rectal diseases. The pathology of adenocarcinoma of the rectum is set out understandably, and much well-balanced information is reinforced by good pictures. Due credit is given to Dukes's excellent work. A short historical survey of treatment is followed by outlines of the established types of operation in use today; Mr. Norbury appears to favour synchronous combined excision, with the patient in the lithotomy Trendelenburg position. Thirteen statistical tables based on the past ten years work at St. Mark's Hospital make valuable study. The length of the book was no doubt limited by the time allowed for the delivery of a Hunterian lecture, but as such it is excellent.

Medicine and Mankind

ARNOLD SORSBY, M.D. Leeds, F.R.C.S. London: Faber and Faber. Pp. 236. 12*s*. 6*d*.

SCIENTISTS in recent years have begun to study the social relations of their subjects, but though there are eight times as many doctors as professional scientists in this country few books written by the medical profession have attempted to relate medicine to the social community in which it is practised. Medicine has been for so long an individual relationship between doctor and patient that neither party to the contract was able to see the wood for the trees. When medicine developed its recent scientific aspect as contrasted with its ancient art, the physician tended even more to lose sight of the patient as a member of a community. Each patient became a test-tube for complicated chemical experiments, conducted in a hospital and unrelated to the world in which the patient had lived hitherto and to which, if fortunate, he would return. It was perhaps the workers in the field of nutrition who reminded us most sharply that man is a social organism, and must be studied in relation to his environment; industrial medicine has also made some pointed comments. But apart from the focusing of attention on particular social and economic factors, few people have found a philosophy of medicine that makes much sense in our world, whether in peace or war.

Prof. Sigerist in his recent book ("Medicine and Human Welfare") indicated the thread that can be traced down the centuries, binding both patient and physician to each other and to their ever-changing environment. Mr. Arnold Sorsby's book develops the same theme, but weaves the thread into a broader fabric. Health and disease are no longer static concepts; each is an unstable physicochemical equilibrium constantly responding to the shifting equilibria of the outer world. The study of medicine, including everything that pertain to the physical welfare of man, must therefore take into account not only the internal structure of man, but also the outer world and his interaction with it. This thesis is elaborated in detail; diseases are conveniently classified as appearing in bodies that are ill-formed, ill-balanced, abused or assaulted—terms corresponding roughly to the genetic, endocrine, nutritional and toxic aspects of disease. Clearly written and well illustrated the book, though designed for a wider public, should appeal to medical readers.

New Inventions

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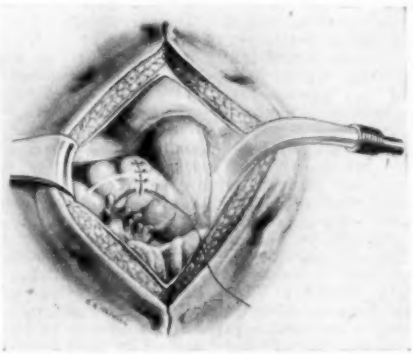

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(Welchir & Burnes: Report to A.M.A., 6.6.41)

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(R. Marinkovitch: Lancet No. 5 Vol. 1, 1941, p. 144)

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(Lancet, 10.5.41)

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(Lancet, 27.9.41)

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(B.M.J., 29.3.41)

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Combating the Common Cold

It has long been a commonplace of popular belief that those who develop the common cold must be "run-down." Modern scientific investigation has offered little more light on the aetiology of colds, though it has shown that the so-called "run-down" state is often directly due to a condition of outright malnutrition or, much more frequently, of border-line nutritional deficiency. Since the discovery of the essential part played by the vitamins in protecting the body against many types of ill-health, much work has been concerned with the probable relation between vitamin deficiency and susceptibility to infections generally.

VITAMIN PROPHYLAXIS

In prevention of the common cold, vitamins A and C are of special interest for their effect in influencing the natural bodily resistance. While the common cold is apparently due primarily to a virus infection which causes congestion of the mucosa of the respiratory passages, the more distressing manifestations result from a secondary invasion by a variety of organisms. This invasion is greatly facilitated by changes in the epithelium of the mucosa, such as are known to result from hypovitaminosis A. As a factor in preventing colds, therefore, the maintenance of the integrity of the respiratory epithelium by ensuring an adequate intake of vitamin A would appear to be logical.

That vitamin C also may directly affect resistance to infection is indicated by recent observations. Since it was shown in 1935[1] that vitamin C increased the resistance of the guinea-pig to diphtheria, other workers have supported the view that this vitamin is of major importance in mitigating diphtheritic infections. In 1938[2] it was suggested that, when the vitamin-C level of the blood is high, streptococci are less likely to be found in the tonsils, and, if present, are seldom virulent. Infections cause a greatly increased demand for vitamin C, so this vitamin may be a factor needed in the production of immune bodies in the serum.

COMPENSATING FOR DIETARY DEFICIENCIES

Interesting and significant as these facts are, it might be argued that no clear-cut case has yet been made out for the specificity of any particular vitamin as a universal anti-infective agent. There is, however, a volume of clinical evidence to show that a sufficient intake of all the vitamins important in the human economy is essential for an optimal state of health, and that such a state offers the best protection against infections such as the common cold. The acknowledged prevalence of dietary deficiency may not unreasonably suggest the possibility of cause and effect.

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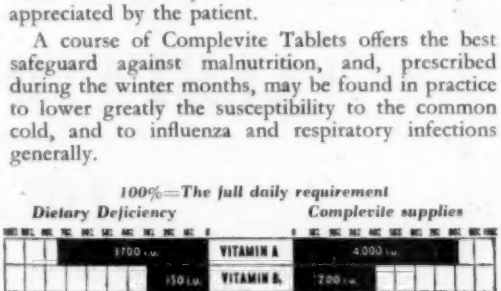

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[1] *J. Nutrition* (1935), 10, 129. [2] *J. Pediat* (1938), 13, 322.

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THE LANCET

LONDON: SATURDAY, JANUARY 3, 1942

STORY TELLING

ON Sept. 25, 1914, ADAMI of Montreal wrote a letter to OSLER of Oxford expressing a desire for a medical history of the war that was then breaking out in Europe. OSLER sent the letter on to KEOGH who at once commissioned BRERETON to prepare the material. This was the beginning of a task which ended only in 1931 with the publication of the twelfth and final volume of a history told on 6000 pages in some 2½ million words. Never before had anything of this kind been attempted and it proved hard going. For a while BRERETON carried on with one lady clerk, but in November, 1914, FLETCHER, on behalf of the Medical Research Committee (Council), offered a statistical department with BROWNLEE in charge. KEOGH then appointed an imposing consultative committee to study the framework of the history; following the way of its kind this committee met but once, leaving the initiative to its joint secretaries, FLETCHER and BRERETON. ELLIOTT collected pathological specimens in France and devised a new system of field medical cards; under his instruction SEWELL and MAXWELL painted their glorious sketches of cases and morbid material. And still the history remained to be written. Only in December, 1918, when the war was over was MACPHERSON given the organisation of the writing, assisted by OSLER, HERRINGHAM, ELLIOTT (medicine), BOWLBY, WALLACE, ENGLISH (surgery), HORROCKS, BEVERIDGE (hygiene), LEISHMAN, CUMMINS (pathology), BROWNLEE, GALWEY (statistics), with FLETCHER and BRERETON for general scientific and historical subjects. On OSLER's death his place was taken by BALFOUR.

And then they set to work. Four volumes of general history to tell of 637,746 hospital beds, 770 medical units, 75 hospital ships, with a total personnel for medical services of 144,514, and 38,000 war diaries to give an air of verisimilitude to the "voluminous administrative medical files." The narrative would have rejoiced ADAMI's heart and the only burning was on the part of those territorial and new military hospitals for whose detailed historical accounts no room could be found. Whether it should serve as an example or as a warning to the future historian is another matter. For reference it is priceless, but judged by literary standards it is more the material for a history than the history itself. Might it not even come under the lash of WELLS's "habitual piecemeal thinking" and still fire some born journalist to tell it again for the plain man in an attractive binding? The next three double volumes were factual records of surgery, disease and hygiene, much of which is still the current stuff of medical thought. The surgeons have left on record only those methods which at the end of the war had been found to be the most trustworthy. It was just bad luck for them that the chemist had not then grafted sulphur and nitrogen on to the benzene ring at the right place. The physicians were handicapped by lack of opportunity for analysis and study of war diseases, for "general military policy" had severely restricted publication of accurate records. The hygienists told of an awakening of the sanitary conscience in all who served in the forces which will prove a lasting benefit to the whole human race; while the engines of war were becoming more complex every day they were getting results from petrol tins and horse sense which rivalled anything before known. The pathologists, content with one volume, were the half-backs who knew best what was going on in the scrum; they were witness of KEOGH's plaint: "We went straight back into all the septic infections of the Middle Ages." Enteric fever might, as LEISHMAN said, have been the subject of the blackest chapter in medical history—but it wasn't. This volume is practically a series of monographs. The last volume on the statistical aspect of casualties nearly didn't see the light at all and was only saved by LEISHMAN's unconquerable tenacity. When the rapid transfer of patients became the rule the Medical Research Council's statistical staff devised an index card to accompany the patient on his travels and to be sent in when completed. This scheme, apparently ideal, miscarried and at the end of the war the central statistical office was inundated with records of every conceivable sort, packed in any order. The work was transferred to the Ministry of Pensions, to whom a complete register of casualties was essential, but only two half-million sets, out of 23 million cards, were analysed for casualties, man-power and wastage, and purely scientific information was passed over. And so the first object of the volume was never attained. Yet as it stands the achievement is remarkable when it is recalled that 40 per cent. of the fighting and nursing services suffered death or some form of war disablement entitling to compensation, and we were the first country to publish total casualties from front line to base.

The story of the second world war will be different. Much of it is already there before the war of nerves gave place to fighting with guns. There is a chapter of prophylaxis, when women and children were being evacuated from town to country, maternity was being safeguarded, regional medical services organised, medical education rearranged. The conquest of fear deserves a chapter to itself. The medical boards will have much to tell when their mouths are opened. The penetration of the essentials of healthy living into factory and workshop demands its teller and the end is not yet; closely related is the replacement of men by women in industry, with due regard for their different physical and mental equipment. This is a people's war and its story will recount the metamorphosis of a leisurely and happy-go-lucky community into a rationalised and intensive one. It would be well to put on record now a picture of the transition while it is still fresh in mind; statistical analysis must wait—maybe it will be only an aid to the diagnosis of cultural interpretation. Photographs are no doubt being collected but many of the changes are so subtle as to require the vision of the artist. It is reassuring to learn that the President of the Board of Education will be chairman of the editorial board. The background of the story will be different too. The Ministry of Health—it is difficult now to credit it—is a product of the last war and its chief

medical officer, leaving places, names and dates to the lay secretary, has concentrated each year on giving a word-picture of the nation's health; his dual office enabling him to cover school life as well. These reports are not being printed in war-time; they have been written and pigeon-holed, and the same, we hope, is true of the detailed reports of the public-health service. Nutrition as a science just peeped out in the last war; it will be a turning factor in this one. Finally, the story when it comes to be published will be read by all thinking people and should therefore be kept within reasonable limits of size and price. For the same tree that has brought forth thorns was correctly stated by the serpent to open the eyes to the knowledge of good and evil.

PLASMA PHOSPHATASE

IN 1923 ROBISON [1] demonstrated in the growing bone of young animals an enzyme capable of hydrolysing organic acid-soluble phosphorus compounds into inorganic phosphate. This enzyme, phosphoric esterase or phosphatase, was later shown to be present in the kidney, intestinal mucosa, muscle and other tissues. Its presence in any organ depends primarily on the functional activity of the cells so that as far as bone is concerned the production of phosphatase is an essential part of the cellular activity leading to deposition of lime. When growth is slow and calcification less intense less phosphatase is produced. Several varieties of phosphatase exist in the animal body, but the bulk of the ferment found in the blood plasma belongs to the group of the alkaline phosphatases which act best in an alkaline medium. The amount of enzyme in the plasma depends on rate of production and the degree to which it is being utilised and fixed in the active tissues. As far as plasma phosphatase is concerned the chief source is bone. Normally an increased osteoblastic activity is accompanied by quicker bone formation. When ossification lags behind cellular activity and phosphatase formation, more ferment spills over into the plasma, so that formation of osteoid tissue is always associated with an increase in plasma phosphatase. Values are highest during the rapid growth of infancy and at puberty, and lowest when cellular activity is diminished as in old age and dwarfism.[2]

The most obvious application of phosphatase estimation is as an aid to diagnosis in disturbances of bone metabolism. Greatly increased values are constantly found in the active phases of osteitis deformans, generalised fibrocystic osteitis, osteogenic carcinoma, osteomalacia and rickets. In rickets and osteomalacia serial estimations of phosphatase enable one to assess the response to treatment. Indeed, it is probable that in these conditions the level of the plasma phosphatase is the most accurate guide to the degree of activity of the pathological process.[3] But the estimation of plasma phosphatase has other objectives. ROBERTS [4] was the first to suggest that it may be used to differentiate between the various types of jaundice. Obstructive cases generally yield high values while toxic cases show only a slight increase. HERBERT,[5] however, has found so many exceptions as to destroy any clear-cut diagnostic value of the test, and further work by AUSTONI and COGGI [6] and by MORRIS and KERR [7] indicates that it is not the presence of bile in the blood-stream but its absence from the intestine that is responsible for the rise in plasma phosphatase. Presumably this is due to the defective absorption of lime when bile is prevented from reaching the intestine and the consequent calcium starvation of osseous tissue. Recently TALBOT and his co-workers [8] in Boston have advocated plasma-phosphatase estimation as an index of thyroid deficiency during infancy and childhood. They have shown conclusively that the value is low in cretinism—an indication that osteoblastic activity is very low at an age when the reverse normally holds good. They also point out that in idiopathic dwarfism a low level of phosphatase may be expected, and the same would apply to renal dwarfism and cœliac disease in the absence of rickets. But to diagnose hypothyroidism simply on a low value for plasma phosphatase may readily lead to the unnecessary, and harmful, administration of thyroid. There is, however, undoubtedly a place for this estimation in assessing the progress of a patient under treatment.

The discovery by KUTSCHER and WOLBERGS [9] that normal prostatic tissue is rich in a phosphatase with optimum activity at a pH of 4·9 has been elaborated by GUTMAN and his co-workers,[10] who showed that this acid phosphatase is also formed in carcinomatous prostate tissue and at the site of skeletal metastases, and is found in the serum of these patients. Use has been made of this finding in distinguishing between osteitis fibrosa and skeletal metastases due to prostatic carcinoma. The differential diagnosis of these conditions is often difficult in the early stages, yielding only to biopsy or long observation. In the bony metastases of prostatic cancer the ordinary or alkaline phosphatase value of the serum may be raised just as in osteitis deformans, but in the latter the acid phosphatase lies within the normal range; only when the disease is far advanced does it rise to some slight extent. Estimation of the acid-phosphatase concentration in serum should therefore be a useful supplement to the clinical and radiological examination of patients with carcinoma of the prostate, especially if operation is in question; an increased value may be the first indication of metastases in the bones.

GLASS WOUNDS

IN this war flying glass has been the cause of a distressing number of injuries, especially of the eyes and face, and many of them were preventable. TYRRELL,[11] in discussing war injuries of the eyes, pleads for a vigorous campaign to bring the dangers home to the public—out of 25 cases of severe perforating glass injuries 10 of the eyes had been gashed beyond repair. And ALABASTER,[12] reviewing 100 eye casualties, records that 21 had penetrating injuries due to metal or glass splinters, and that in 12 of these the eye was completely destroyed. This year's Ophthalmological

1. Robison, R. *Biochem. J.* 1923, **17**, 286.
2. Morris, N. and Peden, O. D. *Quart. J. Med.* 1937, **6**, 211.
3. Morris, Stevenson, M. M., Peden, and Small, J. M. D. *Arch. Dis. Childh.* 1937, **12**, 45.
4. Roberts, W. M. *Brit. J. exp. Path.* 1930, **11**, 90.
5. Herbert, F. K. *Ibid*, 1935, **16**, 365.
6. Austoni, B. and Coggi, G. *Pr. méd.* 1934, **42**, 1594.
7. Morris, N. *Trans. R. med. chir. Soc. Glasg.* 1937, **31**, 48.
8. Talbot, N. B. et al. *Amer. J. Dis. Child.* 1941, **62**, 273.
9. Kutscher, W. and Wolbergs, H. *Hoppe-Seyl. Z. physiol.* 1935, **236**, 237.
10. Gutman, E. B., Sproul, E. E. and Gutman, A. B. *Amer. J. Cancer*, 1936, **28**, 485. Gutman, A. B. and Gutman, E. B. *J. clin. Invest.* 1938, **17**, 473.
11. Tyrrell, T. M. *Proc. R. Soc. Med.* 1941, **34**, 725.
12. Alabaster, E. B. see *Lancet*, 1941, **2**, 369.

Congress at Cambridge took the view that, though eye protection for the soldier had not been favoured by the Military Personnel Research Committee, civilians engaged in war duties should at least be able to buy some form of eye protection that could be attached to the steel helmet, and CRUISE [12] said that half the war casualties which ophthalmic surgeons have to treat might have been prevented by a vizor. TYRRELL advocates a conservative attitude in treating glass wounds of the eye, for he has been impressed by the better results when operative treatment is deliberately delayed. He has found the penetrated glass fragment difficult both to see and to extract, but fortunately it seems to give rise to little foreign-body reaction and the risk of infection is slight. BALLANTYNE [13] and SHAPLAND [14] agree with him that glass in the vitreous or interior of the eye is better left, but in the anterior chamber or cornea it can as a rule be easily removed. The lacerated eyelid TYRRELL has found a difficult problem, for there is no excess to permit of a wide excision and tight suturing results in sloughing with sepsis. He therefore recommends excising only the obvious ragged remnants, and often does not suture the wound. X rays are not always helpful in locating glass splinters in the eyes because the scalp and face are studded with other foreign bodies which overlap and confuse the picture. The general belief that only glass containing lead is radiopaque seems however to be wrong, for GILLAN [15] finds that spectacle glass, window glass, the different types of motor-car safety-glass, and bottle glass will all show up even in the tiniest fragments on a carefully taken radiogram. Glass splinters scatter with terrific force when high explosive is behind them. EDEN and TURNER [16] have seen cases of concussion and contusion of the brain from multiple glass fragments striking the skull with sufficient impetus to drive them right through the bone; their total effect is comparable to a massive blow from a broad object. ZACHARY COPE [17] points out that peppering of the limbs by such fragments may produce a severe anæmia from the puncture hæmorrhages. These peppered wounds require no debridement or exploration to remove the fragments; careful cleaning of the skin is all that is usually necessary. Large fragments of glass—especially those from heavy shop windows—may produce gruesome mutilating injuries and have been responsible for a number of the deaths in thoracic and abdominal cases.

The treatment of the limb injuries due to glass is no different from that of other wounds of war, but since the cuts are clean with little ploughing of the tissues, and since clothing is rarely driven in, primary suture of the wound and of any severed tendon or nerve may be justified. The decision to do primary suture must however be guided by the time after injury when the operation is done, the experience of the surgeon and the operating facilities available. The functional results after successful primary suture of tendons and nerves are undoubtedly more satisfactory than that of later repair. As MASON [18] says, a tendon is a relatively avascular structure and in its early stages of repair must become attached to the surrounding tissue. With a primary suture the surrounding tissue is areolar or fatty; a line of cleavage therefore soon develops and the gliding mechanism of the tendon is now possible. If the surrounding structures are fibrous—as after the healing of an unsutured wound—the healing sutured tendon becomes incorporated in this mass and fixed in its course. In a study of the results of over 200 cases of tendon suture DEBENHAM [19] confirms this, and he says that it is not non-union but adhesions that account for poor tendon-suture results. The most certain way of avoiding the formation of excess fibrous tissue is to have a covering of epithelium. Thus, even if immediate tendon suture is not possible or desirable, primary closure of the skin will have prepared a suitable scarless bed for the subsequent repair. Skin may be sutured up to the 6–8 hour period, but suturing of such an avascular structure as tendon should not be undertaken if the wound is more than 3 hours old. For wounds of the flexor tendons on the fingers, where sheath infection may be disastrous, primary suture of the skin only—never the tendon—is probably desirable. COATES [20] declares that the prognosis of the sutured tendon in the digital sheath is in any event hopeless; but MASON takes a more optimistic view and has had a few successful cases. More frequent primary suture of the severed nerve also seems desirable because the results of secondary suture are so often disappointing—thus STOPFORD and PLATT [21] found in the last war that imperfect recovery of function and sensation was almost invariable, even under the most favourable circumstances, after secondary suture and re-suture. WORSTER-DROUGHT,[22] as a result of his experience of nearly 2000 nerve lesions in the last war, holds that though sepsis may develop, primary suture is valuable in keeping the ends of the divided nerves in close proximity. With the use of sulphanilamide locally and generally, primary suture will be more often successful, and sulphanilamide does not seem to interfere in any way with nerve repair. On the face, where the majority of injuries occur, it will usually be possible to suture the wounds without any extensive excision. Strong antiseptics, such as iodine for the skin are to be avoided, and the studies of SUMNER KOCH of Chicago show that cleansing with soap and water is the most satisfactory method of preparation and disturbs the tissues least. In suturing, KILNER [23] reminds us that a secondary repair can usually be undertaken later, at leisure and with greater care, and with less risk of sepsis or tissue necrosis. The chief bugbear of the plastic surgeon in these cases is stitch marks. It is important therefore to see that the suture material is fine, that it is inserted near the wound edge, and especially that it is removed early. Clumsily repaired face injuries may be particularly mutilating.

More could be done in the prevention of glass wounds. Even if we are indoors it is well to remember MITCHINER'S [24] warning: "When you hear bombs falling in your neighbourhood forget your dignity and fall flat." The steel helmet should be worn indoors

13. Ballantyne, A. J. *Proc. R. Soc. Med.* 1941, **34**, 730.
14. Shapland, C. D. *Ibid*, p. 728.
15. Gillan, R. W. *Brit. J. Ophthal.* 1941, **25**, 117.
16. Eden, K. and Turner, J. W. A. *Proc. R. Soc. Med.* 1941, **34**, 685.
17. Cope, V. Zachary, *Brit. med. J.* 1941, **1**, 523.
18. Mason, M. L. *Surg. Gynec. Obstet.* 1940, **70**, 392; *J. Amer. med. Ass.* 1941, **116**, 1375.
19. Debenham, M. *Calif. West. Med.* 1941, **54**, 273.
20. Coates, J. C. *Brit. med. J.* 1941, **1**, 212.
21. Quoted by Bristow, W. Rowley, *Proc. R. Soc. Med.* 1941, **34**, 517. See Stopford, J. S. B. *Brain*, 1920, **43**, 1; Platt, H. Surgery of the Peripheral Nerve Injuries of Warfare, Bristol, 1921.
22. Worster-Drought, C. *Proc. R. Soc. Med.* 1941, **34**, 529.
23. Kilner, T. P. *Med. Pr.* 1941, **103**, 26.
24. Mitchiner, P. H. *Brit. med. J.* 1941, **1**, 309.

as well as outside by those who must work on during air-raids, for it has prevented many injuries from glass as well as falling debris. The protection of windows by antiscatter liquids, or pasted tape and paper strips, has not proved satisfactory, but transparent films and adhesive textile netting have given good results, the netting being varnished over to prevent trouble from condensation of moisture. A strong adhesive netting, if carried over and securely fixed to the window frames, will as a rule hold the glass in the frame even if it is shattered. Solid shutters of steel or wood, or loose screens, are apt to become missiles themselves, but it is particularly important in hospitals to prepare beforehand some light wooden frames covered with translucent or opaque sheet materials, which can quickly be put up after panes or whole window frames have been blown out. Some hospitals have bricked up the windows of their theatres and resuscitation-rooms and the passages leading thereto. In a ward two or three windows at one end can be completely bricked up while the others are only partly bricked, so that during a raid patients can be congregated in the safe end and ventilation is preserved. With the removal of patients into corridors, or encouraging them to take such homely but effective measures as getting right under the bedclothes or even under the bed, the number of injuries from flying glass sustained in hospital wards has been remarkably small, though this does not excuse the inadequate precautions that many hospitals in unblitzed areas have so far taken.

Annotations

THROMBIN AS A HÆMOSTATIC

Morawitz's theory says that blood-coagulation involves two stages :

Prothrombin + Ca ions + thrombokinase → thrombin
Thrombin + fibrinogen → fibrin

It can thus be seen that thrombin should be an exceptionally powerful coagulant, and Mellanby's[1] preparation of thrombin amply confirmed this forecast. If thrombin is injected intravenously it produces general intravascular clotting, and it is therefore only suitable for local use. Mellanby's method was not adapted for large-scale production of thrombin, and other local hæmostatics have been proposed, such as Russell viper venom, which, like thrombin, has the useful property of coagulating hæmophilic blood ; none, however, have been wholly satisfactory. It has long been known that normal serum has a clotting action, and recently Parfentjev,[2] while trying to free immune rabbit serum from this clotting action, isolated a small globulin fraction which had a very high clotting power. This fraction acted in the absence of Ca ions and could initiate clotting in plasma containing excess oxalate, citrate or heparin ; it could clot blood whose prothrombin had been absorbed; it evidently acted directly on fibrinogen. Taylor, Lozner and Adams[3] identified the fraction as a pseudoglobulin and concluded that it was, in fact, rabbit thrombin. The preparation always contained a small but irreducible amount of calcium. This was insufficient to start blood-clotting in the presence of citrate and oxalate and its constancy suggested that it was an integral part of the thrombin. Reasonably stable solutions of this thrombin could be prepared and absolutely stable dry preparations were obtained by lyophile drying or by precipitation from acetone and drying in vacuo. Lozner and others[4] used this thrombin as a local hæmostatic for small wounds with encouraging results. Trials of various methods showed that gauze bandages impregnated with thrombin powder firmly applied gave best hæmostasis. As expected, they found that it would stop bleeding from small wounds in hæmophilic patients, even when the hæmorrhage had been going on for some days. When teeth had to be extracted in hæmophiliacs a gauze "bite" impregnated with thrombin was applied to the socket immediately after extraction and renewed every 24 hours ; complete hæmostasis was obtained and the sockets healed well. Taylor and co-workers had previously shown that a globulin fraction which promoted clotting of hæmophilic blood could be prepared from the plasma of various animals, including man ; this fraction was much diminished in, though not entirely absent from hæmophilic blood. But this particular fraction is a euglobulin, and the thrombin from rabbit serum is obtainable from the pseudoglobulin fraction that remains after euglobulin has been removed by dialysis for 8 days against tap water. The euglobulin fraction requires the presence of both Ca and prothrombin before it will clot normal plasma and has been named by Howell "plasma thromboplastin" (or thrombokinase). The antihæmophilic substance of Timperley, Naish and Clark[5] had a protein—egg albumin—as the starting-point of its preparation, but the exact nature of this substance has not yet been determined, nor have other workers had comparable results with it ; it was used parenterally, whereas the other protein preparations are emphatically for local use only. The thrombin preparation now put forward is certainly worth extended clinical trial, since apart from its application in hæmophilia any agent that can effectively stop bleeding from a wound has obvious topical use. It is apparently obtainable with reasonable ease and as it has been prepared from ox as well as rabbit plasma it should be available in useful quantities. But as Lozner emphasises, it will have to be used cautiously, since it is very toxic and may result in generalised thrombosis if it is applied parenterally, and he points out that when assessing its value the state of the blood-vessels must also be taken into account.

INFECTION IN THE BATHROOM

IN their report on hospital infection of wounds Prof. A. A. Miles and his colleagues (*Brit. med. J.* 1940, **2**, 855 and 895) mentioned that the inadequately disinfected bath may be a means of spreading infection from patient to patient. The cross infection in hospital wards subcommittee of the Preventive Medicine Committee of the Medical Research Council have received the following statement from a medical colleague in which he testifies, from personal experience, to the reality of this danger.

I was recently a patient in a large general hospital where I would say that the general standard of care in nursing is unusually high. Although a "medical" case, I was bedded, owing to the emergency conditions, in a surgical ward, and I used the common bathroom attached to it. In the mornings I took my turn for the bath with a number of ambulatory surgical cases, and on some occasions the congestion was such that two or more men would be in the bathroom at once ; while one was bathing, the others would be shaving or dressing. It was the ordinary procedure in that particular ward—and, I imagine, throughout the hospital—for the ambulatory and convalescent cases who were permitted, or had been ordered, baths to discard their own soiled dressings on to the floor of the bathroom or lavatory. These dressings, often copiously stained with wound discharge, would remain on the floors for at least several hours, until they were swept up by the ward charwomen, naturally without any antiseptic precaution. The patients who used the

1. Mellanby, J. *Proc. roy. Soc.* B. 1933, **113**, 93.
2. Parfentjev, I. A. *Amer. J. med. Sci.* 1941, **202**, 578.
3. Taylor, F. H. L., Lozner, E. L. and Adams, M. A. *Ibid*, p. 585.
4. *Ibid*, p. 593.
5. Timperley, W. A., Naish, A. E. and Clark, G. A., *Lancet*, 1936, **2**, 1142.

bath, in such rapid succession that there was no opportunity to clean it between users, included cases of draining ischiorectal abscess (who had been urged to lie there and soak, thereby considerably "holding up the traffic") and cases of partially healed carbuncle. I have myself seen a case of ischiorectal abscess from which sloughs were coming away, followed in the bath—after only a change of water—by another patient. While it may be true that the pus from such granulating wounds is unlikely to be rich in living pathogenic bacteria, the communal system under which patients remove their dressings and take their baths in careless proximity is, to say the least of it, unæsthetic and unhygienic; and it is not difficult to imagine forms of infection which might be conveyed by such means. I may add, from my own selfish point of view, that my complaint to the ward sister about the conditions in the bathroom led to my being provided with a generous bottle of a chloroxylenol solution so that I might disinfect the bath personally before using it. On many occasions, too, in concession to my medical fastidiousness, the cleansing of the bath was done for me by one of the nurses; but it is quite clear that time and the amount of work to be got through would have made it impossible for the existing nursing staff to give this special service to every patient. The question of whether rinsing out a used bath with a chloroxylenol solution, applied with a brush or sponge, followed by, say, two changes of water, is an effective way of destroying or removing the bacteria which may be caught up in a "soap-ring" raises technical problems which I am not competent to discuss. I wish to make it perfectly clear that I do not suppose for a moment that the conditions to which I have referred are confined to one particular ward or hospital. It is, as I have already indicated, my belief that the standards of nursing and treatment which I received were indeed exceptionally good.

This writer ends by urging that what is needed to abolish a dangerous source of potential infection is the "revolution" in training and education of nursing personnel called for by Miles and others in their report and emphasised in the M.R.C. War Memorandum No. 6 (Prevention of Hospital Infection of Wounds[1]). The teaching of Lister—like his carbolic spray—may have permeated the operating-theatre and penetrated to the ward; but it cannot be said to have penetrated adequately as yet to the bathroom.

HUNTERIAN REMAINS

LAST winter's raids took a heavy toll of specimens in the Royal College of Surgeons of England. The record of destruction now appears in the scientific report for the year 1940–41. Most of the specimens had been removed to the basements, which had been reinforced to receive them, but the college was exceptionally unlucky on May 10, 1941, when a heavy bomb struck the museum and store rooms, incendiaries increased the damage, fallen girders broke open the basements below and heavy rainfall on the following days drenched the exposed specimens. The losses were serious but not complete. Thus in the anatomical series (in which there were no Hunterian specimens) 1207 survive out of 2569. In the osteological series only 94 of 1655 Hunterian specimens survive, and 6209 of 15,545 college specimens. On the other hand, the whole of the odontological series—including Hunterian and college specimens—remain. Nearly half the 5400 Hunterian physiological specimens have escaped, but only 2026 of the 14,850 college specimens in this series. Of the human and comparative teratological series only 23 of the 170 Hunterian specimens remain, but the college specimens have largely survived. The better part of the Hunterian pathological series remains, though the college specimens have been reduced to about a fifth and the whole of the Toynbee and Strangeways collections have gone; the Army Medical War Collection, as we have mentioned elsewhere (*Lancet*, 1941, **2**, 647) has been reduced from 3000 to 100, and is already being replaced by modern specimens. All the mummied specimens and the historical collection are lost and the instrument collection has been reduced from 2500 to 2000. The zoological and anthropological pictures have survived, and so fortunately have Tonks's war pictures. The total loss of specimens amounts to 39,259 out of 65,827.

The task of salvage was a heavy though probably a grimly fascinating one for the museum staff. Specimens had to be rescued from damp, reassembled, placed in new receptacles when necessary, and transferred to safe quarters. Accommodation was found in 17 widely separated places and the American Ambulance Service kindly provided transport.

1. See also *Lancet*, 1941, **2**, 565.

SALVAGE OF PAPER

WE trust the appeal made in our issue of Dec. 27 has met with a ready and generous response. We feel the requirement of the Government is so vital that a further reminder will not be out of place. We stress that a personal sacrifice must be made in the form of giving up not only waste but many books and papers which are only occasionally in use. It is imperative to contribute all possible because the more salvage secured the less pulp in the country will have to be used for "Munitions of War" and so be available for making paper for printing our journals.

MULE-SPINNER'S CANCER

THE story of mule-spinner's cancer is unsatisfactory because many cases still occur in spite of the known facts about the cause and the methods of prevention—in 1939, 52 cases with 23 deaths were notified to the Home Office. The mule spinning machine was invented by Samuel Crompton in 1779 and was aptly called a mule because it combined the principles of two other machines—Hargreaves's multiple erect spindles and Arkwright's roller and spindle frame For many years the machines were lubricated with sperm or neat's-foot oil, but in 1850 mineral oil began to be added and by 1875 it was the only type used. Fifteen years later, in 1887, the first case of scrotal cancer in a mule-spinner was recorded. In 1906 S. R. Wilson began to study the incidence of scrotal cancer among cotton-spinners admitted to Manchester Royal Infirmary, but it was not until 1922 that he published, with Southam, a full account of the malady with notes of 141 cases. Dr. E. M. Brockbank has now crystallised his wide experience of the problem in book form.[1] As medical referee for industrial diseases he has seen over 180 cotton-spinners who claimed compensation for mule-spinner's cancer, and as chairman of the Manchester Research Committee he has been fully informed of advances in our knowledge of the condition; he has also gained practical knowledge of the cotton trade by visiting the mills and by talking to employers and workers. He accepts the view that the primary cause of mule-spinner's cancer is the mineral oil used to lubricate the machines, but that contributory causes may include excessive perspiration produced by the hot spinning-rooms; friction of the trousers or overalls on the scrotum, set up by the characteristic forward bending movements that the spinners make in piecing together broken cotton threads; insufficient clothing worn about the groins, and an abnormally dry skin which is sometimes seen in the older workers. Over 80% of scrotal cancers in cotton-spinners are on the left side. This is accounted for by the fact that the mule-spinner repeatedly reaches out his left hand while at work and so brings the scrotum in contact with the thigh and oily trousers.[2] Regular periodical medical examination and early treatment of suspicious lesions are placed first on the list of preventive measures; as an additional

1. Epithelioma of the Skin in Cotton Spinners. London: H. K. Lewis. Pp. 36. 4s.
2. See also Brockbank, E. M. *Brit. med. J.* 1941, **1**, 622.

precaution Brockbank recommends that only the least carcinogenic oils should be used for lubricating the machines. To anyone not acquainted with the cotton trade this looks like putting the cart before the horse and thanks to the work of C. C. Twort and his colleagues it is cheap and easy to select the mineral oils which are least carcinogenic. There may well be sound technical and economic reasons why non-carcinogenic vegetable oils are not used on the mule spinning machines, and perhaps Brockbank will tell us the reasons in the next edition of his book. He advises mule-spinners to pay special attention to personal cleanliness, to wear more clothing about the groins, and to use protective ointments, particularly when they have dry skins. But Dr. Watson in his innocence would still ask "Why, my dear Holmes, are men exposed to cancer-producing oils when for many years there have been millions of cocoanut trees in the South Sea Islands eating their heads off?" Although the book does not satisfy Dr. Watson on this point, its accuracy, clarity and soundness will be valued by doctors and laymen interested in the welfare of cotton-spinners, and should stimulate them to increased efforts to prevent the occurrence of scrotal cancer.

THE CAUSE OF PINK DISEASE

THE ætiological possibilities in pink disease are grouped by F. W. Clements[1] in three headings. The virus theory is largely based on the occurrence of the disease in mild epidemics to which may be added the fact that it often follows infection of the upper respiratory tract. A second theory is deduced from the therapeutic success in isolated cases with vitamin B_1 therapy. Against this may be set the general good nourishment of most infants with the disease, which is seen in many breast-fed children with no other obvious evidence of avitaminosis. Clements thinks that vitamin B_1 may help in the removal of accumulated pyruvic acid and similar substances and so have a definite place in the treatment of pink disease, but that the fundamental cause is not necessarily a vitamin deficiency. Writing in Australia, where cereals are extensively produced, Clements is naturally concerned with the theory, originating from Jugoslavia, that pink disease is due to the ingestion of spores of a cereal smut, and this theory is superficially attractive since pink disease commonly appears at an age when cereals loom large in the diet. In Europe the smut incriminated is *Ustilago maidis* which usually infects rye, and hence the label coined in Croatia of "ustilaginism" for the type of pink disease found there. Clements considered the bunt or stinking smut (*Tilletia tritici*) to be a more likely infection of the cereals consumed in Australia, and he therefore confined his investigations to it. Feeding experiments and injections of extracts of spores carried out on laboratory animals, however, failed to produce any toxic or other effects, and he concluded that whatever may be the case in Jugoslavia—where in fact Mayerhofer has drawn a distinction between infantile acrodynia and ustilaginism—there is no evidence that smut-infected cereals play any part in the ætiology of pink disease in Australia. Another ætiological theory has been put forward by T. A. Ratcliffe,[2] who studied 15 cases and was struck by the psychological picture presented by mother and child. All the mothers with pink disease in their offspring whom he interviewed were of the "extravert" type, always fussing, taking the child to a doctor on the slightest provocation; the kind of mother who creates the maladjustments of later childhood. The striking psychological changes in the sufferer from pink disease are well recognised—the profound misery, anorexia, insomnia, sometimes lethargy of an extreme catatonic type and sometimes almost a maniacal state of increased motor activity. Yet sequelæ hardly ever occur so that an organic psychosis produced by encephalitis is unlikely. The skin changes, due to peripheral vascular changes, the hypotonia, and the sensory alterations might, argues Ratcliffe, all be of mental origin, so that among the causes of the disease, which he suggests is a syndrome brought about by many factors, he would include a psychoneurosis.

1. *Med. J. Aust.* 1940, **2**, 430. 2. *J. ment. Sci.* 1941, **87**, 545.

SYNTHETIC ŒSTROGENS

IN 1933 Cook, Dodds and Hewett[1] described the activity of 1-keto-1:2:3:4-tetrahydrophenanthrene, the first synthetic œstrogen, and expressed the opinion that "there are grounds for hoping that substances of a much higher order of activity will be found before very long." The search for synthetic substances possessing œstrogenic activity was extended by Dodds and his collaborators and many compounds were found to be more or less active. One of these, a derivative of the carcinogenichy drocarbon 1:2:5:6-dibenzanthracene, had an activity approaching that of œstriol. Thus far all the active substances contained the phenanthrene ring system, but in 1936 Dodds and Lawson[2] showed that this system is not necessary for œstrogenic activity. The wide field opened up by this discovery was rapidly investigated, and they found that derivatives of diphenyl, diphenylmethane, diphenylethane, and stilbene (diphenylethylene) were œstrogenic.[3] In an attempt at further simplification of the molecule, *p*-hydroxypropenylbenzene (anol) was examined. The high activity at first reported for this substance was soon found to be due to contamination.[4] It was clear from the high activity of the contaminated anol that the œstrogenic activity of the impurity must be extremely great. At this stage Dodds and Lawson at the Courtauld Institute of Biochemistry joined forces with Sir Robert Robinson and his collaborators at Oxford.[5] The union was fruitful. The fruits were stilbœstrol and hexadiene. At the same time an investigation of the active anol contaminant was carried out at the Courtauld Institute, and among the by-products from the preparation of anol was found a highly active substance which was identified as the compound now known as hexœstrol. This substance was also prepared independently, and by a different method, at Oxford.[6] The activity of these compounds is greater than that of œstrone and compares with that of α-œstradiol. Furthermore, unlike the natural œstrogens they are highly active by mouth, a property of great clinical importance. Thus in five years the original hopes were fulfilled. Three compounds available at the end of that period had activities 300,000 times greater than the one known at the beginning. An interesting aspect of these researches has been the activity—albeit small—of relatively simple substances. Derivatives of diphenyl and diphenyl ether, for example, have small but definite activity; α- and β-naphthyl derivatives have also shown activity. Recently N. R. Campbell and F. W. Chattaway have investigated the effect of substituting such binuclear groups, which seem to confer activity in quite simple molecules, for the 4-hydroxyphenyl groups present in hexœstrol. In a communication to the Royal Society they report that such substitutions lead to complete or partial disappearance of activity, and conclude that the 4-hydroxyphenyl group is essential for the high activity of the hexœstrol class. The relative potencies of hexœstrol and α-œstradiol in the Allen-Doisy test is still a matter for discussion. Some think hexœstrol to be slightly more active, others would give it an activity of about a fifth that of α-œstradiol. It does not

1. Cook, J. W., Dodds, E. C. and Hewett, C. L. *Nature, Lond.* 1933, **131**, 56.
2. Dodds and Lawson, W. *Ibid.* 1936, **137**, 996.
3. *Proc. Roy. Soc.* B, 1938, **125**, 222.
4. *Nature, Lond.* 1937, **139**, 1068.
5. Dodds, E. C., Golberg, L., Lawson, W., and Robinson, R. *Proc. Roy. Soc.* B, 1939, **127**, 140.
6. Campbell, N. R., Dodds, and Lawson, *Nature, Lond.* 1938, **142**, 1121; *Proc. Roy. Soc.* B, 1940, **128**, 253.

appear likely that modification of the structure of hexœstrol will produce a compound of higher œstrogenic activity, but further investigation may bring to light new synthetic œstrogens, possibly of altogether new types, which will be incontestably superior to their naturally occurring rivals.

HONG-KONG GONE YELLOW

Dr. P. S. Selwyn-Clarke posted us on Oct. 1 his latest report as director of medical services in Hong-Kong which was ceded to Great Britain in 1841 and now after exactly a century has passed into the hands of the Japanese. It is a mountainous island, about the size of Sheppey, separated from the mainland by a channel from ¼ to 1 mile wide, and made up of bare granite ridges with deep tortuous valleys full of scrub, and a flat fertile coastal strip growing mango, pear and orange with patches of rice and sweet potatoes. The capital, Victoria, has a fine university, founded in 1910, with schools of anatomy, physiology, pathology, and surgery, the last completed in 1934. Around this centre of learning is a Chinese settlement, closely packed with nearly a million inhabitants in normal times and now with another three-quarter million of refugees. Last year the food-shortage was reflected in the first recorded outbreak of fatal pellagra (953 cases with 442 deaths), deaths from beriberi were doubled (7229), an outbreak of cholera had a case-mortality of 66% and left behind a 20% carrier rate in some districts. Smallpox was kept in control by 2¼ million vaccinations. The death-rate (uncorrected) from all causes was 56·9 and might have been far higher had not Dr. Selwyn-Clarke gained direct control of all the health inspectors. He was also reorganising the Chinese hospitals and the welfare centre for mothers and children at Kowloon on the mainland; he had obtained registration of dentists and legislation against spitting. In September he was hoping to start a public-health diploma course for local medical graduates. This is now all a story that is told and we may trust that whatever has now befallen him and his staff they will know the lasting satisfaction of having set an example of enlightened health administration in an outpost of empire. Will the inhabitants still be able to take their choice of Western medicine at Queen Mary Hospital, or Chinese medicine at the Tung Wah and Kwong Wah hospitals? What will be the fate of the pleasant Victoria Hospital for maternity on the slopes of the Peak? Surely the old Government Civil Hospital in among the noises and smells of Chinatown will always be just the same.

OVERDOSE OF SODIUM SULPHAPYRIDINE

"It's not what people die from that surprises me," a shrewd Scottish professor is wont to observe in the post-mortem room, "but rather what they live with." The lungs may be riddled with malignant growths, the arteries all but occluded by degenerative changes, and the kidneys may long have ceased to be worthy of the name, and yet life continues to tick over with remarkable smoothness. Toxicologists too have been known to complain that people who by all the rules of the game should be dead show an obstinate disregard for "fatal doses." The latest example of this obstinacy is a man who received five times the intended dose of sodium sulphapyridine, and it is interesting to note that, whereas mental depression is characteristic of the toxic action of sulphonamides in moderate doses, in this case poisoning had a delirifacient effect. Cutts and Bowman[1] report the case of a labourer aged 26, who after a subtotal gastrectomy for recurrent peptic ulcer developed bronchopneumonia. Sodium sulphapyridine by intravenous injection was ordered, but a 5% solution was used in error instead of a 1% solution, and within ten hours the patient received 30 g. of sodium sulphapyridine intravenously (20 g. at 1.30 P.M. and 10 g. at 11 P.M.). Ten hours after the second dose the blood contained 29 mg. per 100 c.cm. of sulphapyridine. Within a quarter of an hour of receiving the first dose he became extremely restless. Next day restlessness was even more severe; he said he could not lie still, but he remained clear mentally. Attempts to control the restlessness with hypnotics failed, but apparently intravenous injection of hexobarbitone and other quickly acting barbiturates was not tried. Hiccough and vomiting began early and persisted for 36 hours. The urine became dark and smoky and was found to contain red blood-cells and acetyl-sulphapyridine crystals. There was no evidence of hæmolysis. From the 6th to the 13th day of the intoxication jaundice was present and it can be surmised from the report that it was of the obstructive type due to hepatitis with blocking of bile canaliculi. The error in dosage having been discovered by the third day large quantities of fluid were then given intravenously. In the first 24 hours of treatment the patient received 7·5 litres of saline or dextrose-saline and in the next 24 hours 3·5 litres. The urinary output was good, restlessness quickly subsided and the patient began to sleep intermittently. He continued to improve and made an uneventful recovery. Cutts and Bowman attribute his survival to the fact that he was young and to the prompt administration of large quantities of fluids. It is not explained how a 5% solution came to be dispensed instead of a 1%, but no system is completely proof against errors in arithmetic, and the only safeguard lies in conscientious checking of methods and calculations between members of the dispensary staff, especially when potent drugs are being prepared for injection. Possibly the routine use of a hydrometer would provide an additional rough check on the strength of solutions. And there is no doubt that the pharmacist would welcome the general adoption of the practice of writing in full the strengths of solutions when an error would be fraught with serious consequences, thus: "Sodium sulphapyridine for intravenous injection. Send one litre of *one per cent.* solution."

1. Cutts, F. B. and Bowman, R. O. *New Engl. J. Med.* 1941, **225**, 448.

Manchester public health committee have chosen Dr. C. M. BROWN of Middlesbrough to succeed Dr. R. VEITCH CLARK who has worthily held the position of civic medical officer for twenty years.

Lady (ELDRED) HORSLEY, who died in London on Christmas Eve, at the age of 86, had not only kept alive for 25 years the memory of a great experimenter, but she was the untiring champion of the freedom of research on which Victor Horsley's work was based.

NURSES qualifying by examination for the General Register in England and Wales during 1941 were 5353. In addition 1083 qualified for the supplementary part of the register in the following categories: male nurses 21; mental nurses 91; nurses for mental defectives 7; sick children's nurses 306; fever nurses 658. A further 82 were admitted to the register by reciprocity—51 to the general register and 31 to the supplementary part.

MEDICAL SUPPLIES IN INDIA.—At a meeting of the Medical Stores Supply Committee held at Simla on Oct. 6 it was announced that 60% of these stores, as compared with 25% at the beginning of the war, are now manufactured in India. Instrument makers have increased their production and it is now only necessary to import complicated instruments such as cystoscopes and microscopes. Thirty-one drugs have lately been transferred from the imported to the indigenous category, including liq. glucose, nicotinic acid, injectio bismuthi and certain bacteriological stains. Many rubber appliances used in hospital practice are also now made in India, including operation gloves. Important needs still under consideration include tartaric acid, atropine and acriflavine.

Special Articles

TREATMENT OF BACILLARY DYSENTERY WITH SULPHAGUANIDINE

THE War Office has received a preliminary report from Colonel N. Hamilton Fairley and Colonel J. S. K. Boyd on the treatment of bacillary dysentery with sulphaguanidine in the Middle East. So far the drug has been reserved for severe and for persistent chronic cases. This restriction has often led to treatment being delayed to a later stage than would normally have been chosen. Of some 371 cases treated, 135 were cases of Shiga infection, and in this group 96 case-sheets give sufficiently detailed records to permit of analysis. The preliminary report only deals with these Shiga infections, as they give an indication of the action of the drug on the more severe type of case.

ACUTE CASES

The acute cases of Shiga dysentery are analysed in the table. Clinically, the outstanding effects produced by sulphaguanidine are :

1. The increased feeling of well-being within 24–48 hours of administration, rapid relief of abdominal pain and tenesmus, and decrease or disappearance of abdominal symptoms.

2. A fall in the temperature and pulse-rate in uncomplicated cases, often reaching normal in 1–3 days.

3. A remarkable reduction in the number of stools ; as a rule within 5–6 days the bowels are not acting more than once or twice daily.

4. Rapid disappearance of blood from the fæces ; mucus also decreases in quantity but usually takes considerably longer before it finally disappears. This is not surprising since it takes some time for the pathological lesions to heal and the bowel to be restored to normal after the dysentery bacilli have been controlled or eliminated.

The earlier that treatment with sulphaguanidine is begun the less extensive the damage to the colon and the more rapid the convalescence and recovery. The most dramatic cures are naturally found in acute cases treated within 24–36 hours of the onset ; in most cases in the Middle East treatment has not been started until after the 4th day of the disease.

NON-FATAL CASES OF SHIGA DYSENTERY TREATED WITH SULPHAGUANIDINE

Days between onset and beginning of treatment	Cases in group	—	Av. age (yr.)	Av. no. of stools in 24 hr. preceding treatment	Av. time (days) after treatment was started before stools were		
					3–5 per day	2 or less per day	Formed
1–5	39	Shortest	..	..	1	3	3
		Longest	..	..	10	12	17
		Average	25·2	27·8 (34)	4 (26)	5·3(33)	7·7 (30)
6–10	32	Shortest	..	..	1	2	2
		Longest	..	..	10	11	14
		Average	25·7	21·7 (32)	4 (27)	5·4(30)	7·15(20)
11–20	13	Shortest	..	..	1	1	5
		Longest	..	..	5	10	14
		Average	29	14·1 (10)	3 (8)	5 (9)	8·3 (9)
21 & over	12	..	30	Not capable of tabulation in this way.			

In certain of the case-sheets one or more of the data which have been tabulated have been omitted. The numbers from which the averages were struck are shown in parentheses. There is no reason to think that those which are omitted deviated greatly from the average. This applies equally to the 39 cases not included in the table.

SUBACUTE AND CHRONIC CASES

Of the 12 cases shown in the table, 3 have been recorded as possible failures.

In the first of these, sulphaguanidine was started on the 69th day of the disease. Sigmoidoscopic examination revealed a few inflamed patches high up in the bowel. Culture at this stage was negative though *Bacillus dysenteriæ* Shiga had been isolated at an earlier date. The course of treatment given was less than the standard advocated. After treatment the stools still contained clear mucus. The mucous membrane showed no definite ulcers, but one rather raw-looking area was present in the rectum. The mucosa of the sigmoid colon was generally healthy, but some areas were œdematous with a tendency to bleed at the summits of the valves. Culture was still negative. Looseness of the bowels with mucus persisted for some weeks, the bowels acting 4–6 times daily. Healing here was incomplete, but there is no bacteriological evidence to show that this was due to persisting Shiga infection.

In the second case treatment was started on the 42nd day, after the patient had relapsed. A complete course of treatment was given without controlling the diarrhœa. Data regarding the further course of this case are inadequate.

In the third case, *B. dysenteriæ* Shiga was isolated on the 9th and 38th days. Sulphaguanidine was begun on the 41st day. The patient received 96 g. in the next 5 days (an inadequate course). The stools became normal but relapse occurred. Sigmoidoscopy revealed a small red area on the second valve of Houston which bled on swabbing. On the 69th day a second course was started (72 g. in all given). Thereafter the raw area healed and the patient was discharged on the 98th day. It is probable that a full course of treatment in the first instance would have produced cure.

In the remaining 9 cases results were very good. In 7 the stools were normal in an average of 8 (limits 4 and 18) days after beginning treatment. The eighth was a case of special interest which will be recorded in detail in the final report. The ninth (a case of 4 months' duration before treatment was started) improved rapidly and healing occurred within a fortnight of sulphaguanidine being given.

FATAL CASES

In addition to the cases recorded in the table case-notes are available on 5 fatal cases in which sulphaguanidine treatment was attempted. In 2 the patient was moribund before treatment was started, and not more than 12 and 14 g. respectively was administered. A third was cured but died of cerebral thrombosis ; at autopsy the bowel was found to be healed ; pyelonephrosis of the right kidney was also present. The other 2 cases were apparent failures, but one had advanced bilateral hydronephrosis and the other died of lobar pneumonia, which developed shortly after sulphaguanidine treatment was started. In both cases information is lacking in regard to the duration of treatment and the total quantity of sulphaguanidine administered.

COMMENTS

Although no analysis of cases other than Shiga infection is given, cases of dysentery due to Flexner, Schmitz and Sonne infections treated with sulphaguanidine have been restored to health, and rapid healing of the various types of colonic lesion has been observed by the sigmoidoscope. The fatal cases have either received treatment too late or have suffered from some complication such as pneumonia, peritonitis or toxic nephritis established before treatment started.

The action of sulphaguanidine is either bacteriostatic or bacteriocidal. It leads to a cessation of damage to the gut and to an immediate decrease in the production of toxin, as manifested by the rapid improvement in well-being. It appears to exert no effect on dysentery exotoxin already absorbed and circulating in the blood, but in Shiga dysentery at least this can be neutralised by the intravenous injection of Shiga antitoxin. Viewed from this standpoint, sulphaguanidine which is bacteriostatic, and Shiga antidysenteric serum which is antitoxic, are mutually complementary in action. The outstanding indication for the administration of Shiga antitoxin is fulminating Shiga dysentery in which it is imperative that circulating toxin should be rapidly neutralised.

The toxic manifestations encountered have been mild. They have consisted of headache associated with malaise, and an occasional transient erythematous or red papular eruption. No case of hæmaturia has been recorded, and the toxic nephrosis (toxæmic nephritis) which has not infrequently complicated bacillary dysentery has no relationship to the administration of this drug, since it occurs independently of sulphaguanidine administration.

The report ends by emphasising that the cases under treatment were as a rule selected because of their

severity, and that although all fatal cases have been recorded and included only a limited number of the successfully treated case have become available for analysis.

WOMEN AND CHILDREN: A RETROSPECT

ADDRESSING the National Council for Maternity and Child Welfare on Dec. 10 the President of the Royal College of Obstetricians and Gynæcologists told them that their movement was so young that he himself could remember its beginning. In the first decade of this century he was resident at St. Mary's Hospitals, Manchester, when J. W. Ballantyne launched his campaign in Edinburgh for better antenatal supervision and met with opposition, ridicule or faint praise. But today our maternity and child welfare service is built on the fusion of this medical work with a social movement which began about the same time, when groups of educated women who wished to raise the standard of mothercraft founded schools where mothers were taught how better to care for their children. After finishing his resident maternity work he was a member of one of the earliest of these committees. The schools were at first run on a voluntary basis but soon they became too large for voluntary effort, and they were adopted by the local authorities. After the 1918 Act the voluntary basis disappeared in most areas, and today most of them are administered by a paid staff.

Prof. Fletcher Shaw recalled how thirty years ago the women waiting in the outpatient department of a women's hospital were generally dirty, bedraggled and looked much older than their years. They wore ragged, soiled garments and their underclothes were pitiably deficient. A patient often objected to expose the other leg, arm or breast for comparison with the injured one which had been carefully washed. Now the crowd in the outpatient hall differed little in dress from those in the private waiting-room. The white coats once worn for their own protection by medical officers are now worn to protect the patients. Again thirty years ago epidemics of infantile diarrhœa made the hot dusty summers a nightmare. Chubby, healthy infants and toddlers were stricken and in an incredibly short time became pale, emaciated, blue-lipped, apathetic, moribund. With their unsuitable contaminated diet, long-tubed unsterilised feeding-bottles, and rubber comforters picked straight off the floor, it was not surprising that these children were infected. In answer to a question as to what her child was fed on a mother once replied: "Ay doctor, it has just what we have and it'll sup beer as well as thee will." Today infantile mortality is a third of what it was then, and though control of flies, dried milk, re-housing, sanitation, and the development of public health claimed their share in this improvement the teaching of mothercraft had played a notable part. But how much remains to be done was exposed by the first war-time evacuation.

On the antenatal side he did not think they had done so much. Maternal mortality was often taken as the one criterion of maternity work; but it is only one although the most obvious and readily available, and for every woman who loses her life in childbirth there are many who date ill health and disability from the same process. Antenatal supervision had helped to control the incidence of eclampsia and to reduce the number of fistulæ and other obstetric injuries—another reason for this reduction was the better training of medical students—but until those responsible for this supervision were attached to the maternity hospitals and knew the result of every case which had been under their care, we would not get full value from antenatal supervision.

War has brought us problems and peace will bring us more; one of them, Professor Shaw suggested, may well be to increase the number of children in the families. To do this we must see that every woman is cared for in pregnancy, labour and the puerperium and every child from the neonatal period onwards, and we must be able to hold out a reasonable certainty that the mother will return to her normal duties, not only alive, but undamaged. It must be our aim to get every pregnant woman under observation; for there are still too many whose difficulties are recognised only when they are in labour. The greatest confession of bad treatment in obstetrics is the case of failed forceps, and our maternity hospitals still receive as many as they did twenty years ago. Though the increase in the number of maternity beds had been enormous, we still had not enough to meet the demand for institutional treatment and in making plans for the future we must be prepared for still greater expansion. From the woman's point of view, he thought, there was much to be said in favour of the institution. Small homes in which women now take an increasing pride do not lend themselves to obstetrics any more than to surgery; and it is more restful for the mother to be in an institution where everything is done for her and where she is free from household worries.

At present it is left to each local authority to provide its own accommodation. In large industrial areas it is simple to provide one or more hospitals with trained staffs who will get sufficient work to keep them in good practice. But in areas with small scattered populations the system is impracticable, and a patient may not be moved even when the adjacent local authority can provide much-needed help which is unobtainable in her own area. Regionalisation, the solution sponsored by the Ministry of Health, would divide the country into larger areas where it should be possible to establish adequate hospitals with trained staffs; but to maintain a perfect obstetric service there must be team work between the public-health services, obstetricians, maternity and child welfare workers, and midwives. Your share in maternity work, Professor Shaw concluded, is recent, but it is of vital importance. As the maternity services of the country grow, so will your opportunities and responsibilities.

DRUG SUPPLIES FROM THE EMPIRE

THE entry of Japan into the war will interfere with our future supplies of such drugs as menthol, camphor, agar-agar and quinine, and we must look more to the Empire as a source of them than we have done in the past. Can the Empire supply them and why do we not produce all the drugs we need within it? These questions were discussed on Dec. 16 by Mr. Maurice Ashby, PH.D., in a lecture to the Dominion and Colonies section of the Royal Society of Arts. Before the war a large proportion of our drugs came from countries outside the Empire, and Central Europe was our main source of digitalis and solanaceous herbs. Consumption of some drugs has been cut down and the Medical Research Council's memorandum on economy in the use of drugs in war-time, in conjunction with the newly published National War Formulary, will effect further reduction. But quinine and ipecacuanha, to combat malaria and dysentery, are likely to be needed in increased amounts by our Forces in the tropics.

From a cursory inspection of the map of the Empire it looks as though climates of any type are "on tap"; but to transfer medicinal plants from their original habitats to an analogous climate in another part of the world is by no means a simple matter. These plants are grown for their alkaloidal, glycosidal or oil content, and a slight reduction in the percentage obtained from the plant may make their production on a commercial scale too costly. The same botanical species found in different parts of the world may show varying physiological properties. One of the basils (*Ocimum gratissimum*) when grown in the Seychelles yields an oil rich in eugenol; but the oil obtained from the same species grown on the Ivory Coast contains chiefly thymol. Another species of basil when harvested in August has been known to give an oil containing only 47% of camphor, whereas plants harvested two months later have yielded over 70%. Even excess of rainfall may alter the percentage of active ingredients and after a single rainstorm the ephedrine content of ephedra herb is temporarily reduced. These factors all play an important part in deciding whether commercial production is worth while.

The Empire is a rich potential source of most of the drugs which are required, but in many cases collection in the past has been rather haphazard and little thought has been given to future supplies. In Canada cascara has been harvested by completely peeling the bark from wild trees, and this wasteful process causes the death of the tree. Planting and cultivation are now being undertaken based upon a pruning system by which one branch is peeled each year and the tree kept alive. Cascara bark must be stored for at least a year before it is used in

medicine, because fresh bark causes severe griping; so that at least five years must elapse between planting and the preparation of a medicinal extract. This wholesale destruction of trees will cause supplies to be less plentiful for some years to come. The world has hitherto been dependent upon Japan for its entire supplies of agar-agar, but an attempt is now being made to gather the necessary seaweeds from the waters around Australia and New Zealand. Bacteriologists require two to three tons of high-quality agar annually for culture media; it is to be hoped that this quantity can be obtained from the Antipodes. After the dearth of ergot two years ago experiments were set on foot in Australia, at the request of the British Government, for the production of ergot by spraying rye with a suspension of ergot spores. In some cases a good yield of ergots has been obtained, but owing to an exceptionally dry season the results have been rather disappointing. In Australia also there are over two hundred species of eucalyptus, many of which yield oils of medicinal value. One of these, *E. dives*, gives an oil rich in piperitone from which synthetic menthol and thymol are manufactured. New Zealand is a possible source of many of the drugs which were formerly imported from Central Europe, but the high cost of labour would make production too expensive; however, experimental work is being carried out with a number of drug crops to determine what this Dominion could contribute in an emergency.

India is our richest actual and potential source of drugs within the Empire. Podophyllum, belladonna, stramonium, liquorice, squill and valerian are received regularly in London and the lower slopes of the Himalayas offer fertile ground for further crops. Karaya gum is proving a satisfactory substitute for the more costly tragacanth and gum arabic, and Indian colchicum is finding its way into medicine. Cinchona cultivation is rather disappointing, and for many years Java has produced over 90% of the world's supplies of quinine-containing bark. Difficulties of finance and organisation have prevented expansion of cultivation in India, and the bark with the richest alkaloid content, *Cinchona ledgeriana*, has not taken to the Indian climate and soil. The bark now harvested there is used for local consumption and about 5000 acres only are under cultivation out of 38,000 acres regarded as suitable for the crop. South America is still the chief source of ipecacuanha, and the species required by the Pharmacopœia is grown exclusively in Brazil. There are flourishing crops in Bengal and Madras though the total quantity produced is small. The area under cultivation is being increased but the crop is difficult to grow and takes three years to reach maturity, so development is necessarily slow. The West African climate is unsuitable for drug production but East Africa, with its white planters and wide range of climate, has been the scene of numerous experiments in drug cultivation, with varying results. Peppermint has been attacked by a mint rust, which has proved difficult to eradicate, and cascara trees by a fungus. The quality of the cascara bark, however, falls little below that of the Canadian material and attempts are being made to improve the resistance of the trees by grafting them with a hardy local species of rhamnus. Success has been achieved with ephedra and with the basil previously mentioned; and last year pyrethrum to the value of 2½ million dollars was exported to the United States for use in insecticides.

Production of the major portion of our needs within the Empire seems possible but, in the light of what Dr. Ashby tells us, is only to be achieved by a long-term policy of production and guaranteed economic security for the commercial producer.

Dr. F. A. Sharpe in his annual report for the county borough of PRESTON records a slight rise in the birth-rate to 15·77, the highest rate for 11 years; a sharp rise in the death-rate from 12·52 to 14·96 (corrected 16·72); a heavy increase of infantile mortality from 58 to 91, and a high maternal mortality of 7·03. These two adverse rates are in part attributable to the employment of mothers away from home. There was a rise in tuberculosis notifications from 122 to 151, but a fall in deaths from 88 to 71. Cerebrospinal fever caused 13 deaths, but the only information of its incidence given in the report is that 13 cases (1 fatal) were admitted to the isolation hospital.

In England Now

A Running Commentary by Peripatetic Correspondents

THE second course of instruction for Home Guard officers ended at Cambridge just before Christmas. We all lived in college and took our meals together in hall. From 9 A.M. till late at night the forty of us were forcibly fed with every variety of knowledge likely to be useful to a Home Guard. When our official instructors ceased their labours we held meetings of our own to crystallise ideas for presentation to authority. Then came the meeting, attended by persons of eminence in the civil and military medical services, at which we were invited to bring out our questions. We thought the answers were not very satisfactory. The possibility of invasion, we found, was not so stimulating to the civilian authorities as most of us desired, though the Army medical services seemed fully alive to the problems which might arise. The high spot was reached when opinions differed over the question of whether the chief medical officer in each zone (known as the zone medical adviser) should be the county medical officer of health or some veteran of the last war with both military knowledge and habitual independence. The platform affirmed that the M.O.H. was the right person, but was eventually harassed into asking for a vote on the subject; 37 of the 40 students voted against the M.O.H. The remaining 3, who voted the other way, were medical officers of health themselves.

We were told over and over again, in the united voice of many military authorities, that we were front-line troops; we were even told that we were the salt of the earth. We were just feeling solemn over our high dignity and purposes, and much encouraged to persevere, when the cold voice of regional authority remarked that we might be sent hither and yon at the dictate of any M.O.H. who esteemed his work more important than our own. There was nearly a riot. But there is a serious point in all this: arrangements have certainly been made for the disposal of the services of general practitioners in emergency, and the profession is supposed to have been consulted; but no effectual contact has really been made with the average general practitioner. The Home Guard has not been approached, and the Home Guard directorate contains no medical officer with actual experience of Home Guard service, able to resist the wiles of the Ministry of Health. Clearly it may be necessary in emergency to commandeer the services of medical men for duty in areas other than their own, but the existing machinery will almost certainly fail to achieve that end; doctors holding His Majesty's commission in the Home Guard will not take orders from other than military commanders, and it is no use replying that they can be forced to do so. General practitioners are unaccustomed to being forced to forsake what they consider to be important duties, and the atmosphere of actual invasion will certainly not be one in which they are likely to begin obliging in this way. This feeling was clearly emphasised in hundreds of conversations between the officers attending this course.

Our last evening together witnessed a certain freedom of demeanour, but we returned home next day with eyes opened to our duties in conditions which may prevail during invasion, and probably twice as efficient as we had been when the course opened.

* * *

"Here is my M.I. room," I say to Durrant, who takes over tomorrow. "I call it *my* M.I. room because I watched it grow during no less than six painful months; I rescued it from the frightful doom of unimaginative service brown, insisting on cream paint and—well, anyway, I work in it. But the contractor calls it his because he built it, adding a few more feathers to his nest; while every battery commander who comes out here lays claim to it, alleging that the original idea was a child of his brain; and finally, if they were asked, I have no doubt the war-lords would tell you it is theirs because they signed for it. Take your choice. But, of course, henceforth it becomes *your* M.I. room." Durrant's apparent lack of enthusiasm on first beholding the bright gleaming hall of medicine is to be forgiven; after all, he has only just come from a hospital where the magnificence of the interior decoration is well able to stand comparison with this pawky room stuck on a rock jutting out from the sea.

"Good morning, corporal, how many sick today?" "Only Benstead, sir, with another boil, and two men for injection." Durrant's face falls. "Is that all you have to deal with?" he asks. "Not quite, but this is the time of year when one expects men to be reasonably fit, hence small sick parades; in another month or two the numbers will bump up a bit. And I guess you will have a good deal more than this in the next few days: they always try to swing it over the new doctor. It rarely pays them in the end, of course, but they persist in their opinion that it's worth a shot. But this sick parade is almost the least important part of the job, provided that one keeps a sharp watch for the gallant fellow who makes out that his illness is of no account; as often as not that is the man who is liable to be very ill. What matters is to keep the men fit, and that nearly always boils down to keeping them happy and their minds occupied.

"Out here they don't see a tree or a blade of grass from dawn to sunset. Before Hitler engulfed France it was comparatively easy; they all had so many days ashore per week, and many of them could sleep ashore one night a week; but until very recently all that was necessarily stopped. It amounted to this: without having committed any sort of crime they were all perpetually confined to barracks. The situation is easier now with the chance of an occasional week's leave, but at one time sick parades increased steadily in size and strangeness, apparently fit men quite genuinely producing the most amazing and sometimes alarming symptoms—exhibiting, in fact, the major signs of that wretched disease 'ennui.' We conferred at length on the subject and invented a variety of means to stimulate interest, until now it is fair to say that morale is back on the high plane where one tries to keep it. A medical officer must constantly mix with the men, talk to them and, above all, listen to them, keeping a watchful ear for the first signs of unhappiness; more often than not he can put in a word in the right quarter that will nip trouble in the bud, and help in a humble way to keep a unit cheerful in dull days. He has a great opportunity in a small sphere within the Army to look beyond the manifestations of disease. Benstead's boils are an example. It isn't unusual, in a unit of this size, to find one man whose boils are resistant to treatment at the start, but at my first sick parade on this fort there were half a dozen men with boils or other minor but irritating skin conditions. It was the depth of winter, and the supply of fresh vegetables had been eliminated by frost. After a good deal of amused backchat on the part of the 'Q' side, and a heated affray with one commanding officer who mistrusted me as a harbinger of 'sloppy soldiering,' we managed to obtain a regular supply of oranges until the spring, and the plague of minor complaints subsided. In fact one might go so far as to say that the whole object of a doctor's existence in this type of job is to have nobody on sick parade at all." Durrant looks disheartened.

"But it's doubtful," I hasten to add, "whether one could ever achieve such a desirable state on this particular fort, because with infinite trouble I have now induced such a high degree of 'inoculation-mindedness' in the sergeant major that he always contrives to bundle one or two men into M.I. room for injections. However, don't allow yourself, as I once did, to be overwhelmed with enthusiasm and try to get the whole business cleared up in a week. One morning a large supply of calf-lymph arrived and, after a long harangue on the worth of vaccination (which is, of course, voluntary) and after assuring my victims that it would not protect them against the common cold, typhus, plague, influenza, hammertoes or a hundred other ills (for prophylaxis against which they professed that they would willingly consent to any torture), I eventually persuaded a large horde, including some officers, to try it. A few days later I trembled in front of an explosively indignant and serious-minded commanding officer, who had discovered that if Hitler chose to come that night he would find half the unit nursing arms of raw beef and rising temperatures, almost incapable of fighting the guns; and did I realise that I, a mere non-combatant, had put the entire coast in jeopardy? All I could do about it, of course, was to write a stiff letter to the vaccine merchant. He was particularly interested, as he told me in his reply, because my story tallied with many similar experiences at about the same time, and he hoped that I would let him know when it happened again."

"All the same, the morning's work doesn't seem to take very long," says Durrant, still inclined to decry his new job. I try to fill in the apparent gaps in the day's routine. I point out that, for one thing, this is only the first of the chain of forts for which he is responsible. "When do you visit the others?" he asks doubtfully. "When they send for me and if I can get a boat." Again I sense that he feels he has shattered the illusion of work, but at this moment a squad of men march into the room, seize a stretcher and haversacks of equipment and march out again. I take Durrant outside to watch them demonstrate their prowess at first-aid, and tell him that each morning he must take a squad from the off-duty watch and train them in stretcher-bearing, including the gymnastic feats required to move injured men from some of the most likely but least accessible parts of the fort. I also warn him that the colonel is apt to hurtle out in his speed-boat at any moment, declare war, and expect the M.O. and his myrmidons to treat and remove to safety any casualties that he may care to create. The potential arrival of the colonel is as a sword of Damocles hanging over the heads of the garrison. No matter how rarely the thread may be severed it serves to maintain a high state of vigilance, because to those who are caught unprepared these visits can be even less desirable than a visit from the enemy.

While Durrant is thinking this over I hasten to thrust home one or two more blows. This state of preparation, I point out, has to be induced and maintained on all the other forts too, and though it can be done easily enough on this fort in the morning the M.O. has to get down to it again in the afternoon at one of the other sites, at times when the men are free of other duties. He is also the local public-health department, and at least once a month must inspect and report on the health of the men and the sanitary state of their surroundings—an inquisitive job. The first task is easier here, cut off from land, than ashore, because the men can strip in the open air in good sunlight and the M.O. can swiftly tell if anybody is harbouring any of the more intimate and irritating insects. This monthly inspection is an ideal opportunity for checking up on any man who may indulge a distaste for soap and water; as the man turns away the neck comes prominently into view. If there is any cause for suspicion the man is questioned straightforwardly about his ablutionary habits. If the answer is unsatisfactory, his name is handed to the sergeant major with a definite warning that any recurrence will be dealt with summarily. On a sea-girt fortress it would be simplicity itself to put this warning into practice—the miscreant would be thrown into the sea without further ado and coram populo. There may be two reasons why I never had to put this dire threat into execution. In the first place men hate to have among them any of the great unwashed, and once attention has been drawn to such a man one can depend on his associates to keep him up to scratch for the rest of his Army life.

But this did not altogether explain it, so when after several months no man had been caught twice and when, indeed, there were no more offenders, I asked the sergeant major if he could offer any further explanation. "I don't know exactly, sir, but it may be because of what happens after you give me their names, sir." The twinkle in his eye at this stage compelled me to the silence which would rank as permission to carry on. "What actually happens, sir, is this. I tell them to parade at fourteen hundred hours sharp outside the battery office, and after allowing them time to reflect and cool their heels for five minutes or so, I open the office door and without so much as a by-your-leave as you might say, and without bothering to lower my voice, I simply give them a brief outline of the more elementary principles of hygiene." While he pauses to refill his lungs I imagine with mirth the trumpeting tones of that gargantuan voice, with its ripe southern county intonations, crashing, resounding and echoing up and down and round and round the interior of the fort, informing the world that Gunners Smith and Jones have failed to wash their necks. He continues, "I then summon a couple of likely-looking fellows to conduct the

aforesaid gentlemen to the showers, and I have heard that when they arrive there they are stripped and scrubbed." No, they never tried it a second time.

The second monthly inspection is of the men's barrack-rooms, the cookhouse, their ablutions—in fact of their whole domestic scene. The battery commander on each fort accompanies the M.O., followed of course by the sergeant major; and with the coöperation of these two dignitaries there are many small ways in which the M.O. can improve the comfort and living-conditions of the men. The secret of this inspection is to keep a sanitary diary; a correct Army Book exists for the purpose but any fair-sized notebook ruled in three columns will do. In one column the M.O. notes any improvements he thinks necessary, the battery commander adds his notes alongside, and finally the M.O. inserts in the third column at a later date when and if anything has been done about it. This diary is passed right down the line each month and is the cause of considerable competition between the forts concerned. One of the officers complained that I had given his unit the stick for three successive months while appearing to be sublimely indifferent to the disgusting state in which X (his great rival) kept his fort. I dared not point out that the facts spoke for themselves.

* * *

"Where the Ward Round Rubs" reminds us forcibly of the need for cautious utterance and behaviour at the bedside. Too often we forget that the obliging provider of physical signs is a sentient being acutely interested in his illness and in everything which is said about it. I remember being taken aside when a very raw dresser and being firmly told by the Chief that "cancer" was always "neoplasm" in the patient's hearing, and I can vividly recall the horror in the faces of a mother and her strapping schoolboy son with a patent interventricular septum when an exhibitionist senior physician described graphically the serious risk of infective endocarditis, of which he knew I was well aware. What a lot a word of explanation can do to allay the terror of the unknown. What looks of frightened suspicion are cast on a negligently brandished patellar hammer until its innocent purpose is realised, and what dread of imminent electrocution dismays the timid old lady attached to the electrocardiograph when the hurried operator has omitted his stereotyped reassurance. The electrocardiograph reminds me of the much-demonstrated patient with coronary thrombosis who cheerfully remarked, "My word, you've got to mind your P's and Q's here!" and immediately fell back dead.

MILK AND EGGS FOR INVALIDS

ON Dec. 11 the Ministry of Food made known by public advertisement the diseases and illnesses for which special supplies of milk are available to invalids on the authorisation of a medical practitioner (see *Lancet*, Dec. 27, p. 809). Similar publicity was given on Dec. 28 to the priority supply of eggs. Four eggs instead of the normal allowance of one will be available at each distribution to invalids suffering from:

Gastric, duodenal or anastomotic ulcers. Post-operative conditions after an operation on the stomach or duodenum.

Disease or injury to the mouth, throat or gullet.

Typhoid or paratyphoid fever, and amœbic or bacillary dysentery, under treatment in hospitals, &c.

At the same time Lord Woolton made an appeal to the public to respect and support the high standard of professional conduct among the certifying doctors. "I have asked people," he said, "to restrict their use of milk for a few weeks in order that those who really need it should get enough. It is a small sacrifice compared with the sacrifices men are making every day in the fighting services. Therefore I ask those who want more milk, and think they may be able to get it with a medical certificate, not to burden the energy and conscience of a great profession, already vastly overworked, by making unjustified claims for priorities. I ask them only to apply for these certificates when they can conscientiously say they require them, and not as a means of getting round the restrictions."

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M.P.

ON Tuesday, Dec. 16, Mr. H. B. Lees-Smith was in his place on what is still known as the front opposition bench and asked the Lord Privy Seal to state what was the business to be brought before the House. On Friday his death was reported to the House, as all deaths of members are, by Mr. Speaker, and Lord Winterton and others paid tribute to the man who will perhaps best be known in the future as one of the founders of Ruskin College at Oxford, but to all M.P.s as a great authority on procedure and as a pillar of the Labour Party. To those who saw Mr. Lees-Smith earlier in the week he seemed in his normal health but all in Parliament are under a severe strain.

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Mr. Lees-Smith's last public appearance brought forward, among other items, the announcement of a debate on the war arising out of the situation in Malaya and the loss of the *Prince of Wales* and the *Repulse*. The debate took place on Dec. 19 immediately before the adjournment, but as it took place in secret any comment will have to be postponed until it ceases to be a matter of current history. But before the debate became secret there was a significant challenge to the Government on their proposal to adjourn the House until Jan. — This was resisted by Mr. E. Shinwell on the ground that when so many urgent questions require discussion and when the war situation is so delicate so long an adjournment was not advisable. Mr. Shinwell proposed an amendment to adjourn the House until Jan. — and he was supported by Sir John Wardlaw-Milne. Other Conservatives also supported Mr. Shinwell as did Liberals and most of the Labour Party. If Mr. Attlee would not accept the amendment Mr. Shinwell proposed "with the help of my honourable friends" to divide the House. The dilemma was clear and a threat of a defeat in the division lobbies clearer. Mr. Attlee went into a front-bench consultation with the Chancellor of the Exchequer on one side and Mr. James Stuart, Conservative chief whip, on the other. But the crisis was not solved by these three alone. Captain H. D. R. Margesson, now War Secretary, but for many years Conservative chief whip and director of much of Conservative tactics in the House, dived into the huddle. Mr. Attlee was seen industriously taking notes and in a few moments he rose and said that as the Government always wished to meet the views of the House he would agree to accept the amendment. On which the Speaker put the vote formally and Jan. — it is. The Government has been shaken—the experiences in the Far East too painfully recall earlier experiences in France, Norway, Greece and Crete and the House was in no mood to accept the Government's ipse dixit. "Even if," as was said, "we may have to meet on Christmas day."

* * *

The week began by the Chancellor of the Exchequer informing us that we were now spending £83 million a week and that the vote of credit which he presented was the fourth billion-pound demand for the year. With regard to savings the Chancellor suggested that about a third of our people are saving on a scale that is fully adequate, another third on a reasonable scale, but the last third is not saving at all. But Sir Kingsley Wood refused to specify to what sections of the community his remarks applied. The interest of these figures—rough as they are—lies in the fact that it may be necessary to introduce more stringent measures to ensure saving. The introduction of a new special security which can be tendered in payment of certain taxes may be not unconnected with this; the necessity of correcting "the excess of purchasing power" and of "an elaborate system of controls and rationing" of commodities were dealt with and attention called to the "steadiness" in the cost of living, the maintenance of peace-time social services and the low interest paid on loans. But "the price of our economic security is unrelenting sacrifice."

Mr. F. W. Pethick-Lawrence spoke in the same way, "if once saving were inadequate to fill the gap between taxation and revenue, inflation would begin." But

Mr. Pethick-Lawrence said that for the poorest people in the community, those at or below the poverty-line, saving was not possible. And for manual workers, above the poverty-line, "to sacrifice the standard of life which makes for the full health and efficiency of themselves and their families would be a grave blunder." To make saving effective there should be double the amount now put aside. But the question is one which is very difficult to solve without some form of compulsion. There are for instance the black-market gentry.

Mr. Graham White drew attention to the German practice of complete rationing, price fixing and wage stoppage "over the whole field from the very outset." The motion passed, of course, and without a division, but the existence of large numbers of people at or below the poverty-line is a grave weakness in a time of national peril.

* * *

Not unconnected with these reflections is the introduction of the Education (Scotland) Bill by Mr. Tom Johnston by which he said the Government were "exceedingly anxious to make a big new advance in nutrition." "I believe," he said, "that the science of nutrition will do for public health what sanitation did for it in the last half-century." The bill was necessary because the aim of the Government was "to prevent malnutrition instead of trying to remedy it." It is, however, a late awakening. As Mr. Kenneth Lindsay, formerly parliamentary secretary to the Board of Education, said, "it is rather ironical that . . . it has taken not one war but two wars . . . to make the people of Scotland wake up to this public scandal" of underfeeding. But the question remains—will the school feeding be properly carried out? For that we must wait and see.

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So the House after another day devoted, before the secret session, largely to the Home Guard, has again adjourned. But it will soon meet again, and there may be in 1942 plenty of work for the Home Guard.

FROM THE PRESS GALLERY

Immunisation against Malnutrition

ON Dec. 16 the House of Commons turned "from the sombre and enthralling present to plan for the future of little children," when Mr. T. JOHNSTON, the Secretary of State for Scotland, opened the discussion on the second reading of the Scottish Education Bill. He said there were few immediate and practical measures in public health which he could commend to the House with better heart. He recalled how the foundations of the milk in schools scheme had been laid on the results of the milk-feeding experiments in Lanarkshire in 1930, which started with 20,000 school-children. School-feeding was especially desirable now when many mothers were at work; also its cost was low and it conserved food. In Glasgow children get a substantial two-course meal for 4½*d.*, in Edinburgh and Dundee for 4*d.*, and in Aberdeen for 3*d.* The Government did not want to begin a school-feeding system on a high-charge basis. They did not want school authorities to make profits. They were anxious that it should be a nutrition experiment which would prove to be a definite advance in human well-being. He hoped that before long 20% of the children attending schools in Scotland would have a hot midday meal. They aimed at reaching the highest possible nutritional standard at the lowest possible price for the maximum number of children. He would also like to encourage the teaching of cookery. The Oslo meal system where it had been tried in Scotland had not commended itself entirely to the school-child, who regarded a vegetarian diet of that kind as not very appetising. Anyhow the Oslo meal must be abandoned for the moment for lack of the necessary materials. To facilitate the rapid expansion of the school-meal service the Government had as from Oct. 1 last increased the grant to local authorities by 10%, with the proviso that the grant should not exceed 95% nor fall below 70% of the total expenditure. The supply of certain rationed foods for school-children had been authorised in rural areas where it would be difficult to organise a cooked meal service, and an improved scale of allowances for children in those areas had been announced.

The aim of the Government was to prevent malnutrition instead of trying to remedy it after unmistakable symptoms had appeared. Where school meals were provided they should be available for all school-children, whether the parents could afford to pay or not. Under the 1908 Act authorities may only provide meals if it is shown that a child "by reason of lack of food is unable to take full advantage of the education provided." The new bill would give authorities power to feed all children, whether they were necessitous, undernourished, or not and payments could be recovered from the parents afterwards where the education authority thought fit. The Bill also swept away the present elaborate procedure and made it obligatory on the authority to provide food where a child was found to be undernourished. Meals could be provided both on days when the schools meet and other days. The authorities at present may feed necessitous children under five. The new bill empowers authorities to continue feeding these children after they reach the age of five until they go to school. Deaf, blind and defective children who are educated by special provision, whether in schools or at home, also came in for the benefit of these arrangements.

Lieutenant Commander CLARK HUTCHISON (Edinburgh West) in his maiden speech congratulated the Government on the clear language in which the bill is written. The measure, which was pleasantly free from reservations and restrictions, regularised what had long been the irregular practice in the more enlightened parts of Scotland. He asked whether children in nursery schools were included in the bill. Mr. J. MAXTON pertinently inquired what pressure could be brought to bear on some recalcitrant authorities who were apt to take their responsibilities lightly and count the bother and the cost. He hoped the meals would not be so cheap as to be neither agreeable nor nutritional. Above all he urged that this should not be looked on as another job for the teachers. He realised the educational value of a meal at school but multiplication tables were also necessary and the teachers were primarily there to fill the youngsters' minds and not their stomachs. He hoped that special staffs would be engaged to prepare the meals.

Major C. N. THORNTON-KEMSLEY said that though Scotland was rightly proud of the education she offered, her record for health and nutrition was not so good. It was a country in which "the piece" was deeply entrenched and communal meals for children would need careful preparation and intelligent cooking. Experience in Wales had not been encouraging—only 4% of the elementary school-children had taken advantage of the facilities provided—they must do better in Scotland. Mr. KENNETH LINDSAY emphasised that a bill for social progress depends on its administration. Most of the opposition to communal feeding was on the ground that it was breaking up the home. But he held the view that until a number of things were taken out of the home—as industry was and put in the factory—no working mother is likely to have a decent life. He asked who was to bring to the notice of the education authority the children who need food. Mr. JOHNSTON interjected: the medical officer, the teacher, the attendance officer, members of the school board, anyone, and Mr. LINDSAY replied that a job that belongs to anyone is very often not done. He suggested that the local authorities should survey the children and that the department should make a covering survey. This had been done in twelve counties in England in recent years.

Mr. J. WESTWOOD, joint under secretary for Scotland, who replied, said that the Secretary of State was going to appoint a nutritional expert to help the local authorities. At present only 7% of the school-children were getting a solid meal. They aimed at 20% by midsummer, but that would not be the end. He gave an assurance that children attending nursery schools were included in the bill. He would have liked to see the school medical services more fully developed, but that was one of the things that would have to be tackled after the war.

QUESTION TIME

Maternal Mortality in Scotland

Mr. T. E. GROVES asked the Secretary of State for Scotland in how many areas the Maternity Services (Scotland) Act was now operative; why it was not operative throughout Scotland, and in view of the increase of maternal mortality, what steps were being, and were proposed to be, taken in order to reduce such mortality; what were the causes of such mortality; and

what directions had been given to local authorities direct or through medical officers of health to meet the present situation.—Mr. T. JOHNSON replied: The act is in operation in 40 out of 55 local authority areas. In most of the remaining 15 areas the introduction of the scheme has been delayed because agreement with the local medical practitioners has not been obtained. In one of these areas, Glasgow, the corporation have met the position by special arrangements to provide midwife, doctor and specialist services under previously existing powers. The causes of maternal mortality were investigated by an expert committee whose report was published in 1935.[1] The medical officers of the Department of Health for Scotland maintain regular contact with local maternity services and medical officers of health in an attempt to ensure that everything possible is done on the lines of the recommendations in that report to safeguard the health and lives of mothers. The arrangements for supplying free and cheap milk to expectant mothers should also make a valuable contribution towards their health and safety. The Scottish committee of the British Medical Association is endeavouring to persuade doctors in several of the remaining dissident areas to accept service.

National Wheatmeal Bread

Sir ERNEST GRAHAM-LITTLE asked the Minister of Health whether he would instruct medical officers of health to institute inquiries in their districts as to the quality and composition of bread supplied under the designation of national wheatmeal, and afford such officers facilities for bringing to exposure and prosecution instances of breach of regulations defining the proper constitution of wheatmeal flour, as set out in the Ministry's circular 2407, 1941.—Mr. E. BROWN replied: The composition of national wheatmeal is prescribed by orders made by the Minister of Food, who I understand is inquiring into the question of maintenance of quality.

Sir E. GRAHAM-LITTLE: Is the Minister aware that the circular 2407 (1941) issued by his department to medical officers and institutions under its direction conveyed the assurance that national wheatmeal flour contained the greater part of the germ of the wheat and was consequently of high nutritive value; and, as this assurance was not correct, if he would withdraw the circular and explain the position.—Mr. BROWN: In the circumstances I see no need to withdraw the circular.

Distribution of National Milk

Mr. DAVID ADAMS asked the Parliamentary Secretary to the Ministry of Food whether, as he had decided to distribute the fruit juices and cod-liver oil for young children through child-welfare centres, he would now make the receipt of national milk for nursing and expectant mothers and children up to five years of age contingent upon the children concerned attending the child-welfare centres and thus secure the return to these centres of many thousands of children lost to them due to the general distribution of national milk.—Major G. LLOYD GEORGE replied: I cannot accept a proposal which would inevitably reduce the number of children receiving benefit under the National Milk Scheme.

Plague in Kenya

A single case of plague occurred in Kiambu district in January, 1941. Cases were reported at Nairobi and in South Kavirondo district in February, at Mombasa and in Fort Hall district in June, and in Nyeri in July. No further extension of the infection has been reported. The latest return shows that the total number of cases detected has amounted to 449, of which 114 have been fatal. Most of the cases have been bubonic plague, but cases of pneumonic plague have occurred. A close watch has been kept on the position among rats in Mombasa but no infected rats have been discovered.

(Mr. G. H. HALL replying to Major A. M. LYONS.)

Medical Care

Major G. OWEN asked the Minister of Pensions whether, in view of the fact that a large number of dependants of men serving in H.M. forces were unable to meet the expenses of private medical treatment, he would arrange to provide facilities for them as are provided for panel patients.—Mr. W. PALING replied: I am not aware of any evidence to support the suggestion, having regard to the recent improvement in the scheme of war-service grants, which now provides for grants towards the expenses resulting from serious and prolonged illness in the household.

1. Report on Maternal Morbidity and Mortality in Scotland.

Letters to the Editor

POSTURE DURING SLEEP

SIR,—I became interested in the subject which Dr. Schütz raises in his letter of Dec. 20 some 18 years ago when an accident prevented me lying as usual on my right side. I noticed how difficult it was to accommodate myself to lying on my left and wondered why. Observations in general practice are inevitably disconnected, but as the result of those I made I came to the conclusion that a normal healthy person usually lies on the right side, unless circumstances make this uncomfortable. Where there is some subclinical involvement of the heart action he tends to switch over to the left side, and if the heart is involved still further he will come back to the right once again. When the heart improves—for example, after recovery from an infection—he will find himself going back again to the left side and then on to the right once more as recovery becomes complete. I followed this sequence through a number of cases, and though it is impossible to draw definite conclusions I feel sure that a change of habit should make us think of a cardiac cause. Where a person usually lies on his left side I think there is probably some slight cardiac inefficiency, though it may not be clinically detectable and only suggested by, say, a rheumatic family history or an old attack of diphtheria. I believe this sign of posture during sleep may be a valuable index of cardiac efficiency, but I should be glad to hear the experience of those who have studied the matter with such a possibility in view. I know that I persistently sleep on my right side, but occasionally find that before I can settle off I have to lie for an hour or so on my left; and I have always found that this has been after a succession of short nights or some other extra strain. It would be helpful if such a correlation exists, since it would enable a patient to realise when he was doing too much. What the mechanism is I have no idea.

Further down the scale of cardiac decompensation, I might mention a useful sign of heart failure which seems to be ignored in English journals but which impresses itself on the patient and is often misunderstood by the physician—nocturnal polyuria with relative diurnal oliguria. The mechanism in this case is clear. During the day the circulation is taxed to its utmost, but with improved circulation during the night the kidneys begin to secrete more freely and as a result the patient has to get up to pass urine 2 or 3 times. The symptom is thus a very early sign of heart failure. A timely explanation of its meaning to a patient may enable him to regulate his life in such a way as to live within his limits without curtailing his activities too much. It is really a delicate physiological index of cardiovascular overstrain and deserves to be more widely known and utilised.

Winsford, Cheshire. W. N. LEAK.

EMOTION AND DIASTOLIC PRESSURE

SIR,—Is the effect of emotion on the diastolic blood-pressure sufficiently recognised? As a member of a medical recruitment board this question has recently been brought to my notice by the dictum of a medical board inspector that emotion influenced the systolic pressure but not the diastolic.

A retired officer, aged 50, was desirous of re-entering the Army, and, knowing that I was a member of a medical board and wishing to save himself a long and possibly fruitless journey, he asked me to give him a preliminary overhaul. This I did in the manner prescribed by the board. He appeared organically sound, and his nervous system and urine were normal. His blood-pressure was 100/83 mm. Hg, estimated at the point of sound disappearance as prescribed. To save him a 20-mile cross-country journey I took him by car to the next board meeting. He passed grade I in everything except his blood-pressure, which according to examiner no. 3 was 180/100. I explained the situation to no. 3 and the chairman. The former gave me the idea he would be no party to manslaughter, and the latter pointed out to the candidate the stresses he would incur and deferred him for a month, provisionally grading him IV. On my return home I asked the candidate to allow me to take his pressure again. The readings were 140/83. It is true I used a mercury sphygmomanometer and the board's instrument is a spring

one, but I cannot believe this amount of discrepancy was due to instrumental error.

When I was in private practice patients several times came to me because they had been refused for life assurance and wanted to know why. As I could find nothing wrong, I communicated with the M.O.s concerned and was told in each case that the refusal was due to high blood-pressure. I watched these people for years, during which their pressure remained normal. It seems to me that in all these cases the effect of emotion is very obvious. I wish I knew how (apart from a soothing manner) I could eliminate it. No. 1 examiner's life is full of difficulties. Is every recruit with tachycardia and a slight tremor to be marked "unstable and will require watching"? Even if the board had an expert psychiatrist (which it has not) the expense of referring 50% of candidates would be heavy. The difference between male and female recruits is also interesting—the women, with few exceptions, being very much more at their ease.

Tunbridge Wells. H. O. BUTLER.

EMERGENCY MEDICAL SERVICE

SIR,—The Chancellor of the Exchequer exhorts us to make an intensive effort to save. May I be permitted to point a way by which large sums can be retrenched without imposing hardship or unfairness?

There are a large number of doctors employed on a part-time basis at a salary of £500 per annum, plus petrol allowance, by the Emergency Medical Service. They have done little or nothing in return for this retaining fee. It is common knowledge that many of these doctors live so far from their hospitals that when a blitz occurs they are unable to reach their units in time to be of any assistance. It is equally well known that the part-time man continues to do his private or specialist work as in times of peace. Finally, seeing that many members of this service are young men under the age of 45, surely it is time they were conscripted. All that they are doing at present is to build up a strong hospital and private connexion at the expense of their more patriotic colleagues.

If it be considered at this critical time of acute shortage of medical officers in the Services that these young men are essential to the E.M.S., then surely they should be employed on a whole-time basis and required to live in their respective hospitals; failing this they should be conscripted immediately, or as a means of economy they should be deprived of their unearned emolument and/or put upon a rigid sessional basis.

Harley Street, W.1. V. B. GREEN-ARMYTAGE.

ANÆSTHETIC FLOWMETERS

SIR,—In disputing the accuracy of your note on Rotameters in the *Lancet* of Dec. 6, 1941 (p. 718) Dr. Magill (Dec. 20, p. 776) claims that he had a flowmeter of the rotameter type made in 1928. In modern usage the word "type" has become suspect (cf., red wine, Port type). Did the bobbin of this flowmeter rotate? Because as the name indicates therein lies the very essence of the Rotameter. The tapered tube is, of course, part of innumerable flowmeters, old and new, but it is the free spinning of the bobbin which eliminates errors due to friction against the glass wall which makes the Rotameter so accurate and popular. Rotameters were used in industry before the last war, and later were tried out and rejected—possibly because they were then too cumbersome—by the late W. J. McCardie of Birmingham. Early in 1937 Richard Salt, technician of this department, was given a month's leave of absence to investigate the various commercial flowmeters and see whether they could be adapted to anæsthetic practice, and his diary records his visits to the various firms. The Rotameter was the most promising device he saw, and at his suggestion it was modified to meet the requirements of practising anæsthetists. Mr. A. Charles King sold the first of these anæsthetic rotameters, and, referring to his catalogue, wrote to me just before the war: "I propose making a foot-note on the rotameter page herewith as follows:

"The adaptation of the Rotameter to meet modern anæsthetic requirements was suggested by Richard Salt of the Department of Anæsthetics, Oxford."

Nuffield Dept. of Anæsthetics, Oxford. R. R. MACINTOSH.

JAW CONTROL IN CONVULSION THERAPY

SIR,—The use of a gag to protect the tongue during therapeutic convulsions entails certain risks. If a wooden gag is used the teeth may be broken. Even with a rubber gag the lips may be caught between the gag and the teeth, the jaw may be dislocated, and in spite of the gag the tongue may be injured. It therefore occurred to me to try to control the jaw without using any form of gag. Although during the first part of the tonic stage the depressors of the mandible contract powerfully, at the beginning the contraction is relatively weak, and I found that it was quite easy to prevent it simply by applying firm pressure to the point of the chin with one hand. It is even easier to prevent the jaws from opening during the clonic stage. The object is to keep the teeth of the upper and lower jaw in apposition throughout the fit. The soft parts then have no opportunity to slip between them. The only difficulty arises with very powerful subjects, and even these can readily be managed by this technique after a little experience with weaker patients. I have used this method extensively and have found it uniformly satisfactory. Only patients with very defective dentition are unsuitable, especially if one jaw is entirely edentulous. I believe it is superior to the gag method, and I would like to recommend it to others using induced convulsion therapy.

Glasgow Royal Mental Hospital. F. P. HALDANE.

NOT SO STERILE WATER

SIR,—A family of children evacuated to a farm in Devon during the blitz promptly gave all the local animals appropriate names. A very thin cat became Mrs. Thin. Another not so thin was called Mrs. Notso. Mrs. Notso in due course had seven kittens. You put your finger on the spot in your annotation of Dec. 27 when you remarked "It seems pertinent to ask whether the severe headache which may follow spinal anæsthesia is not sometimes due to meninges infected in this way." Not so sterile water is, like Mrs. Notso, responsible for many catastrophes.

Ciba Laboratories. T. F. M. SMART.

"A CONTRAST"

SIR,—To question the value of nursing as a career, or of the training given to nurses, on the ground that one institution at which a baby died of suffocation was staffed by an inadequate number of unqualified nurses, is scarcely a scientific procedure. From this one instance, Dr. Esther Carling (in your issue of Dec. 13) deduces that it is natural for parents to hold back their daughters from a nursing career, "if they are liable to be confronted with conditions such as the above during their so-called 'training.'"

The institution in question is not a training school for nurses and at the inquest the girl who had been on duty when the baby died said she "had had no training as a nurse." I need not remind Dr. Carling that no girl can qualify as a nurse unless she enters a hospital which is approved as a training school. There are over 700 approved schools to choose from in England alone, not one of which would have gained approval on the conditions to which reference is made. We know that there is still much to be done before all nurses everywhere get a fair deal, but many training schools now offer their nurses excellent conditions, and many of us who have chosen nursing still think it a fine career.

The general public is years behind the times in its ideas of a nurse's life and work, and most aspirants to nursing have to meet the opposition of the older generation. Is it too much to ask that in the interests of justice such an extremely atypical case as the above should not be cited as an argument against taking up nursing as a career?

21, Cavendish Square, W.1. MURIEL M. EDWARDS, Secretary, Nursing Recruitment Centre.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

Obituary

PERCY FLEMMING

M.D. LOND., F.R.C.S.

Percy Flemming was one of those modest and retiring people whose lifework is done so unostentatiously that its merits are liable to be underestimated or wholly ignored. My intimate association with him commenced in 1899 when we were both clinical assistants to Sir John Tweedy at Moorfields. Shortly afterwards he was appointed ophthalmic surgeon to University College Hospital and I became his clinical assistant there and at Moorfields. Still later I became his colleague at both hospitals, and after our retirement from hospital work we served together on a committee for the prevention of blindness. It is not too much to say that I owe more to his help and encouragement in ophthalmology than to anyone else. In this respect I am by no means alone; for one of Flemming's joys in life was helping lame dogs over stiles. He was a born teacher, and his patience and perseverance in imparting his profound knowledge, whether of anatomy, ophthalmology (both medical and surgical), or archæology (especially of London), were illimitable. In all these subjects he was a master. In ophthalmology he was a first-class clinician and a good operator. He was no narrow specialist, for his proficiency in anatomy and medicine stimulated his special interest in the ocular signs of general disease, such as thrombosis of the cavernous sinus, with valuable results. It is much to be regretted that his contributions to ophthalmic literature were comparatively few; for only his colleagues and students are fully aware of the extent and scientific accuracy of his clinical work. He was deeply interested in the social and preventive aspects of ophthalmology, and the admirable report of the Departmental Committee on the Partially Blind was largely due to his untiring energy and level-headed judgment. It is not surprising that he was specially devoted to his alma mater, University College, for he was an alumnus of University College School, a fellow of the college, and the last professor of ophthalmology in it before its absorption in the University of London, as well as ophthalmic surgeon to University College Hospital. While most ophthalmic surgeons who have had the honour of being members of the staff of Moorfields have become attached to it with love and veneration, there can be no doubt that Flemming, though not wanting in the same sentiments, remained specially devoted to his first love, and no-one was more loyal to the great traditions of University College Hospital than he.

J. H. P.

Flemming was born in London in 1863, the eighth child in a family of nine; there was no medical tradition and circumstances demanded that he should get qualified as soon as possible. From University College School he went on to the college at the age of sixteen, taking the M.R.C.S. from U.C.H. in 1885. After qualifying he returned to the college as a demonstrator of anatomy in order to earn enough to take up a house-physiciancy for which at that time a charge of one pound a week was made for board. Then for some years he demonstrated for Thane, and coached for qualifying examinations. It was in this way that he met his wife who was a student at the Royal Free Hospital. He even took women students into the anatomy museum at University College and was reprimanded. A vacancy occurring at U.C.H. as junior ophthalmic surgeon (to Tweedy) he missed election at first intention but a year later, when the successful candidate resigned, he took his place and laid the foundation of a consulting practice which later became very large. His election to Moorfields soon followed. Flemming's contributions to medical literature or proceedings were small. He found writing difficult and was shy of talking in public; but in talking to small gatherings or to students he found enormous pleasure. Retiring from the active staff of U.C.H. at the age of 60, when his private practice was still large, he soon felt he was not performing enough operations to keep his hand in and decided to retire from professional work. In 1928 he selected a date and on the appointed day moved from Harley Street to St. John's Wood. A complete Londoner, he did not consider spending his retirement outside London. His hobby was history, architectural and ecclesiastic, and he found enjoyment in identifying and classifying prints in the London Museum. He also served on two committees of the Board of Education. Only in the spring of 1939 did he begin to feel that his wife and he were getting rather old for London, and they moved to Pangbourne, where Mrs. Flemming predeceased him by a year.

JAMES HUGO GRAY

M.D. ADELAIDE

BRITISH anatomy has suffered a severe loss in the death, at Epsom, on Dec. 20, of Prof. J. H. Gray, of St. Mary's Hospital medical school. It was only in April last that he succeeded Prof. J. E. S. Frazer in the chair of anatomy at the age of 32. He was born in South Australia, the eldest son of James T. Gray, of Orroroo, Dalhousie. As an undergraduate in Adelaide he was a pupil of the late Prof. H. H. Woollard, and quite early in his career he determined to follow his chief and become an anatomist. He became student-tutor in anatomy at St. Mark's University residential college, but he was not yet qualified when Woollard left. Having finished his medical course in 1932 with a resident post at Adelaide Hospital he was for a short time a demonstrator of anatomy under Prof. H. J. Wilkinson before coming to this country to work with Woollard at St. Bartholomew's Hospital, where he held a research fellowship under the auspices of the British Empire Cancer Campaign. When his chief went on to University College, London, Gray accompanied him as senior demonstrator, working on the lymphatic system, a field which he was rapidly making his own.

Thelma Durgan, Adelaide

After Woollard's death in January, 1939, he buried himself in research and teaching with the evacuated medical sciences faculty at Cardiff, and later at Leatherhead, where he succeeded in inspiring students with his own enthusiasm. During his undergraduate days he had accompanied four expeditions into Central Australia to study the aborigines both on physical and cultural lines, the anthropological side of anatomy ranking only second to his interest in the lymphatics and their relation to the spread of cancer in the body. Altogether he published some twenty considerable papers and reports. He leaves a widow and three young children.

MAJOR MARTIN MCAULEY MORROW, R.A.M.C., died in Palestine on Sept. 8 from the effects of a motor accident. He was twenty-nine years of age, and went to school at the Methodist College in Belfast. He graduated in medicine from Queen's University, Belfast, in 1936, and after holding resident appointments at the Royal Victoria Hospital, and at Londonderry Mental Hospital, he joined the R.A.M.C. in September, 1937, and proceeded to Palestine in 1938. As an undergraduate, Morrow was a sound rugby forward and was cruiserweight champion of Queen's in 1934; the same sterling qualities were showing in his professional work. He married Miss Joan Ashton in 1941.

RHYMNEY COTTAGE HOSPITAL.—This hospital, which is owned and administered by the workmen of Rhymney, was damaged by a cloud burst which occurred in the district on Oct. 5. The Nuffield Provincial Hospitals Trust have made a grant of £200 to the hospital which will make good the whole of the damage.

Public Health

From the Annual Reports

BRIGHTON

Dr. Rutherford Cramb in his report for 1940 says: "In spite of war conditions, the general standard of health in the borough was remarkably good." The birth-rate was 12·48, the death-rate 13·9 and infantile mortality 69. In 1915 the birth-rate was 16·87, death-rate 16·2 and infantile mortality 97. In 1938 the infantile mortality was 61; it has never been low in Brighton. Of the 134 infant deaths in 1940, 59 occurred in the first month and 75 later; pneumonias and bronchitis accounted for 32 of them and diarrhœa for 18. Among infectious diseases, measles gave 2675 notifications with 3 deaths and whooping-cough 391 notifications with 4 deaths. From Dr. Cramb's school report we learn that of 2954 children treated for skin conditions, 210 had scabies, 625 impetigo and 1021 septic sores. The diagnosis between impetigo and septic sores is to some extent a distinction without a difference, but the greater frequency in children than in adults of local coccal infections of the skin without general reaction calls for inquiry.

LEICESTER

Dr. E. K. Macdonald's 1940 report is the 92nd of the series. The estimated population of Leicester in the mid-year was 259,400, an increase of 20,231 on the 1931 census figure. The birth-rate was 13·89 and the death-rate 14·47 crude and 14·75 corrected. Infantile mortality was 51·2; cancer mortality 1·77, and tuberculosis mortality 0·9. The report is of an unfavourable year with a severe winter quarter. Measles gave 5878 notifications with 10 deaths; scarlet fever 1315 notifications with no deaths; whooping-cough 306 notifications with 2 deaths; cerebrospinal fever 135 notifications with 10 deaths; and diphtheria 840 notifications with 50 deaths. The last is serious. In the report of the isolation hospital we are told that more cases of diphtheria were admitted than in any previous year, the disease "remained of the severe malignant type" mostly caused by the gravis strains. Three cases of diphtheritic respiratory paralysis were treated in a Both respirator; 2 recovered, 1 died. Last year 3355 children were immunised against diphtheria. This is satisfactory, for the number is not far short of the 3604 births in the year. But Leicester was tardy in adopting inoculation, so that only 13,088 children have been immunised altogether. Bronchitis, which had killed 69 persons in 1938 and 91 in 1939, scored 437 deaths in 1940, and pneumonia with 595 notifications and 207 deaths compared unfavourably with 400 notifications and 138 deaths in the previous year.

Suicides declined from 61 in 1939 to 45 in 1940. There were 343 new cases of pulmonary tuberculosis and 101 of non-pulmonary; the former was the highest number since 1936, the latter the highest since 1928 when 117 cases were notified. With the exception of that year and of 1921, when 105 cases were notified, 1940 had the largest number of new cases of non-pulmonary tuberculosis in any year since notification started in 1918. This rise has been fairly general throughout the country. The main increase is in tuberculous meningitis, to which 19 out of the 34 deaths accredited to non-pulmonary tuberculosis were due. A satisfactory feature is a drop in new cases of phthisis in persons aged 15–24 years; yet it is curious that of cases detected in the ages 15–19 the males are about half and the females twice as numerous as in 1939. From the report of the city general hospital we learn that in the past nine years admissions have increased 250%; confinements 600%; operations 900%; X-ray work 550%; and pathological work 1000%.

Infectious Disease in England and Wales

WEEK ENDED DEC. 13

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1392; whooping-cough, 1715; diphtheria, 1203; paratyphoid, 17; typhoid, 16; measles (excluding rubella), 886; pneumonia (primary or influenzal), 966; puerperal pyrexia, 168; cerebrospinal fever, 126; poliomyelitis, 18; encephalitis lethargica, 1; dysentery, 105; ophthalmia neonatorum, 76; No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on Dec. 10 was 1385, including scarlet fever, 163; diphtheria, 320; measles, 38; whooping-cough, 478; enteritis, 48; chicken-pox, 38; erysipelas, 31; mumps, 17; poliomyelitis, 4; dysentery, 8; cerebrospinal fever, 18; puerperal sepsis, 17; enteric fevers, 17; malaria, 1; other diseases (non-infectious), 107; not yet diagnosed, 80.

Deaths.—In 126 great towns there were no deaths from measles, 2 (0) from enteric fevers, 2 (0) from scarlet fever, 11 (1) from whooping-cough, 29 (2) from diphtheria, 37 (2) from diarrhœa and enteritis under 2 years, and 21 (2) from influenza. The figures in parentheses are those for London itself.

Leeds and Bristol each reported 1 death from an enteric fever. There were 7 fatal cases of diphtheria at Liverpool.

The number of stillbirths notified during the week was 205 (corresponding to a rate of 40 per thousand total births), including 23 in London.

Medical News

University of Oxford

In a congregation on Dec. 13 the degree of M.D. was conferred in absentia on H. de B. Kempthorne and E. C. O. Jewesbury.

University of Cambridge

At recent examinations the following were successful:—

FINAL EXAMINATION FOR M.B., B.CHIR.

Part II.—Physic, Pathology and Pharmacology: J. D. Atwell, A. P. Bentall, H. Butler, D. Caddy, W. H. Chase, J. W. A. Crabtree, R. A. D. Crawford, E. D. Cullen, A. Davies, J. P. Donnell, H. L. Ellis, E. J. S. Evans, T. N. Fison, G. C. Franklin, D. S. G. Genge, N. Gillman, E. V. Hope, A. E. Howarth, D. H. King, F. M. Lancaster, J. J. Landon, S. E. Large, A. G. Leishman, D. McAnally, C. W. F. McKean, H. L. McMullen, S. L. Melville, J. N. Milnes, P. H. Nash, J. H. C. Phillips, R. J. F. H. Pinsent, G. F. Purves, A. H. Rea, E. Rhodes, W. S. Rhodes, R. D. Rhys-Lewis, P. Sainsbury, F. E. T. Scott, W. H. Scott-Easton, J. A. Smith, G. O. Storey, J. H. Tasker, W. H. Tattersall, D. G. Vulliamy, M. M. Walker, and D. G. Wraith.

University of Leeds

At recent examinations the following were successful:—

M.D.—R. G. Smithson.

FINAL EXAMINATION FOR M.B., CH.B.

Part I (Old Regulations).—Dorothy J. Armitage, T. E. Bairstow, J. W. Bishop, E. K. Blackburn, Mary Braithwaite, J. G. Brocklis, J. S. Cason, L. Crawford, C. B. Dawson, Joan A. Dawson, L. S. P. Divers, F. F. Edmonds, Mary Eglington, H. Gray, Joan Hall, Elspeth Harrison, E. B. Harrison, Kathleen M. Harrison, G. Hipps, J. D. M. Holt, Mary Johnson, J. A. Judson, H. M. Kershaw, H. S. Klein, T. G. Kletz, C. E. Lacey, R. E. Lawrence, G. K. Laxton, Margaret N. Lea, M. A. Lecutier, H. Lee, R. Levy, C. L. Lewis G. L. Middleton, L. L. Miller, D. T. Milnthorpe, E. K. Morris, E. Neil, J. B. Raper, H. Riley, Betty Sanderson, S. Smith, P. M. Smith-Moorhouse, R. M. Stamp, H. Stead, W. S. Suffern, J. W. Taylor, A. Wertheimer, G. M. Williamson, and Pauline Wynne.

University of Liverpool

At recent examinations the following were successful:—

M.D.—R. R. Hughes.

FINAL EXAMINATION FOR M.B., CH.B.

Part I.—J. Ainsworth, A. M. Brenner, N. Broughton, P. S. Dearden, E. G. Donovan, P. M. Edis, K. B. N. Freeman, J. Gould, F. E. D. Griffiths, Betty Hargreaves, B. T. Harrison, H. Holden, C. A. Hopkins, J. G. P. Jones, J. D. King, J. W. Langley, Constance G. Lee, A. McPherson, W. E. S. Marshall, J. W. Maybury, J. K. Meiring, Janet B. Mercer, Sheila L. Richardson, J. J. Rivlin, J. M. G. Sarson, W. Sircus, A. Stone, A. H. Swithinbank, Nora Taggart, C. Taylor, D. W. Townley, Simone J. van Son, J. G. Warbrick, Margaret A. Williams, R. D. B. Williams, and F. B. Wright.

Part II.—Muriel C. Andrews, D. Annis, A. Ansell, E. R. Banner Beryl R. Bentley, Margaret J. Blackburn, R. A. Blyth, H. O. M. Bryant, E. Burman, W. G. Canning, Eva V. Cooper, K. H. Dalrymple, A. S. Davidson, H. Davidson, G. Davies, J. N. Dearnaley, J. F. Doherty, K. E. Donnellan, Ann Donnelly, J. F. Ferguson, I. H. Foy, H. Francis, H. G. Frank, H. Friend, S. M. Green, F. D. Griffiths, Elizabeth M. Harper, E. N. Hugh-Jones, A. Jolleys, Eirwen M. Jones, S. E. Keidan, D. A. Kininmonth, H. Lewis, I. P. Madhok, Margaret L. Magee, A. W. Merrick, Jean C. Miller, A. F. Murphy, R. C. Nairn, K. H. Oldfield, N. E. Raybould, J. S. Redfern, R. L. B. Roberts, M. J. R. Ryan, Betty Schofield, H. R. Shepherd, Nora Taggart, G. H. Thomas, K. B. Thomas, Doreen M. Watt, Hugh O. Williams, and Margaret Woolfenden.

Scottish Nursing Committee

Mr. T. M. Taylor, LL.B., professor of law at Aberdeen University, has been appointed chairman of the committee set up to deal with the salaries of Scottish nurses. He succeeds Lord Craigmyle who has resigned on account of ill health.

Notes, Comments and Abstracts

LIVING BACKWARDS

". . . He's in prison now being punished: and the trial doesn't even begin till next Wednesday: and of course the crime comes last of all."
"Suppose he never commits the crime?" said Alice.
"That would be all the better, wouldn't it?" the Queen said.

Child guidance workers, if they do not endorse the White Queen's views on punishment, share her belief that it would be better if the crime was never committed; they agree, in fact, that it is better to get the treatment in first. Dr. Harry Edelston, speaking on child guidance to Leeds magistrates, pointed out that the offence for which a delinquent is brought into court is seldom the first. There is generally a history of trifling offences culminating in the one which has led to the charge. Thus a child may have begun thieving by sneaking a penny or two from his mother, with little attempt at concealment, and have gone on to cover thefts of shillings by denial and deceit; he very likely passed to similar adventures outside the home and finally to gang activities with a group of companions. Adolescents can be difficult to help, especially when they have been in court, and the aim of the child guidance centre, he said, must be to get hold of delinquents before they commit their offences, for then there is a good chance of curing them. Children whom nothing seems to touch are rare; and these may become hardened by wrong treatment so that they become the recidivists and tramps of the next generation. Even if a child is untreatable his state can be diagnosed more quickly and with less mishandling at the child guidance clinic than by the process of trial and error which existing social machinery imposes.

For the most part, however, children respond to simple adjustment of their home and school difficulties. Punishment must be reserved for occasions which demand it, and it must be recognised as a temporary failure in the normal affectionate relations between parent and child; for, though sometimes necessary to protect others, it is not conducive to the highest type of moral behaviour. In the child guidance clinic it is possible to achieve the sympathetic atmosphere in which the confidence of the child and the parent can be gained. This is not always easy, for both parties usually arrive in a defensive state. It is natural for children to lie when there is a threat of punishment hanging over them; and as Dr. Edelston pointed out evasion and deceit are not the prerogative of children only. Closely interwoven with many of the behaviour problems encountered are the social evils of poverty, overcrowding and lack of outlet for young emotions, lack of recreation. When it comes to allocating blame he is cautious: often the environment is mostly to blame by making demands on the child with which he cannot cope. He instanced the case of a girl of twelve, a petty thief and a truant from school; she had won a scholarship to the high school, but being only moderately intelligent the keen competition overwhelmed her. Moreover, her parents were poor and she could not afford a part in the normal social activities of the school; she was conscious of her threadbare clothes. Between punishment at home and unhappiness at school she had no heart for work, and it took a long time to help her to adjust herself. Closely interwoven with many of the behaviour problems encountered are these social evils of poverty, overcrowding, lack of scope for emotional outlet, and for recreation. Often the psychiatric social worker at the clinic can do much by introducing the child to a more suitable kind of work, to a club or some other social group.

MORE VICTORIAN GIANTS

THE second volume of "British Scientists of the Nineteenth Century" (Pelican Books, 6*d*.), by J. G. Crowther, comprises short biographies of three more of the outstanding scientific figures of that time. William Thomson, afterwards Lord Kelvin, who possessed immense intellectual strength but lacked intellectual taste, seeming at times to be impervious to the ideas of others and who (according to the author) allowed himself to be diverted from pure to applied science at the dictate of capitalism. James Clerk Maxwell, the greatest theoretical physicist of the nineteenth century who, by his mastery of contemporary modes of thought, did so much to direct the path of future research. William Henry Perkin, the father of the aniline dye industry which was afterwards developed on the grand scale and with such portentous consequences in Germany. Despite some highly technical discursions, which might have been simplified or omitted in a popular work, the intelligent and uninformed reader will not find himself bored by this book.

MANCHESTER'S NEW M.O.H.—Dr. C. M. Brown has been appointed medical officer of health for Manchester in succession to Dr. R. Veitch Clark who retires in July.

Dr. Brown, who is 39 years of age, graduated M.B. from Glasgow University in 1924. He took his D.P.H. two years after and in 1930 he was awarded his M.D. with commendation for a thesis on artificial pneumothorax in the treatment of pulmonary tuberculosis. He was called to the bar at Gray's Inn in 1934. Dr. Brown has had wide experience of the public health service, for he acted as deputy M.O.H. for Ely county council, as M.O.H. for Whittlesey urban district council, and as senior assistant M.O.H. and T.O. for Hull, before taking up his present post as M.O.H. and school M.O. for Middlesbrough and port M.O. for the River Tees.

ROYAL SOCIETY OF MEDICINE.—On Wednesday, Jan. 7, at 2.30 P.M., Dr. J. F. Halls Dally will deliver his presidential address to the section of history of medicine of this society. He will speak on the evolution of modern medicine.

Appointments

AITKEN, ROBERT, M.D. EDIN., F.R.C.P.E.: medical referee for cases of dermatitis, &c., in Haddington, Linlithgow, Midlothian and Peebles.

ARNING, DOROTHY, M.A. OXFD, M.B. MANC.: temp. asst. M.O. for Surrey.

BLEADEN, F. A., M.R.C.S., D.P.M.: temp. senior asst. M.O. for Erdington House, Birmingham.

DANGERFIELD, DAVID, M.R.C.S.: asst. M.O. at G.W.R. Medical Fund Society's Hospital at Swindon.

JEFFRIES, MARY, M.B. DURH.: temp. asst. M.O. for Surrey.

ROULSTON, EMIL, M.B. BELF.: resident anesthetist at the Royal Sussex Hospital, Brighton.

SMITH, ROGER, M.B. LPOOL: R.S.O. at the Royal Sussex Hospital, Brighton.

WALLACE, NORAH, M.R.C.S.: temp. asst. M.O. for Surrey.

WRIGHT, H. J., M.B. DUBL.: senior asst. M.O. at St. Richard's Hospital, Chichester.

Victoria Central Hospital, Wallasey.—The following appointments have been made:—
HAMILTON, JOHN, F.R.C.S.: asst. gynæcological surgeon;
PHILLIPS, T. J., M.R.C.S.: asst. ophthalmic surgeon; and
BROWN, HERBERT, L.D.S.: dental surgeon.

Births, Marriages and Deaths

BIRTHS

CRESSWELL.—On Dec. 16, the wife of Major Pearson Cresswell, R.A.M.C.—a daughter.

EVANS.—On Dec. 21, at Stourbridge, the wife of Mr. Philip Jameson Evans, F.R.C.S.—a daughter.

HOFFMANN.—On Dec. 25, in Oxford, the wife of Dr. Wilfrid Hoffmann—a son.

MOYNAGH.—On Dec. 23, at Exeter, the wife of Captain Kenneth Moynagh, R.A.M.C.—a daughter.

PREWER.—On Dec. 23, at Maidstone, the wife of Surgeon Lieutenant R. Russell Prewer, R.N.V.R.—a daughter.

SAVAGE.—On Dec. 26, at Maidstone, the wife of Major Oswald Savage, R.A.M.C.—a son.

TRACEY.—On Dec. 24, at Exeter, the wife of Dr. John Tracey—a daughter.

MARRIAGES

BRYAN—SINCLAIR.—On Dec. 27, in London, Charles Walter Gordon Bryan, F.R.C.S., lieut.-colonel R.A.M.C., of Harley Street, to Molly Kestell Sinclair.

DEATHS

CLEGG.—On Dec. 23, John Gray Clegg, M.D. Lond., F.R.C.S., late surgeon to the Manchester Royal Eye Hospital.

DAVIS.—On Dec. 22, 1941, at Oxford, Charles Noel Davis, M.D. Lond., D.P.H., D.T.M. & H., late of Shanghai.

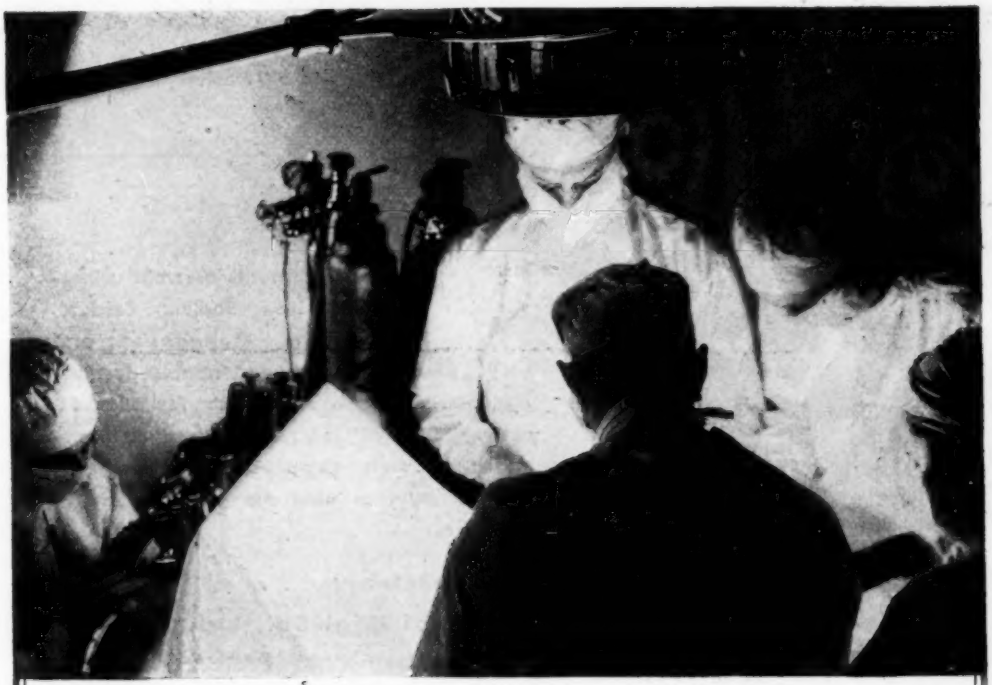
DRYLAND.—On Dec. 28, Leslie Winter Dryland, D.P.H., K.St.J., of Kettering, Northamptonshire, aged 73.

FULLER.—On Dec. 24, in Bath, Alfred Leonard Fuller, F.R.C.S.I., M.R.C.S., aged 71.

JONES.—On Dec. 26, at Hendon, Isaiah Henry Jones, M.R.C.S., aged 81.

KINGDON.—On Dec. 21, at Lock's Heath, Southampton, James Renorden Kingdon, M.R.C.S.

LONGLEY.—On Dec. 28, Joseph Alan Longley, M.B. Leeds, F.R.C.S.E., of Greta Cottage, Saltburn.



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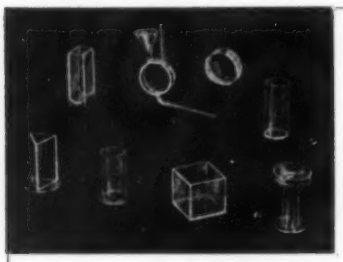

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The fee for the above course is £3 3s., which is payable at the time of enrolment on 5th January.

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BRITISH POSTGRADUATE MEDICAL SCHOOL

(UNIVERSITY OF LONDON)

WAR MEDICINE—19th to 23rd January, 1942

Monday, 19th Jan.	10 A.M.	Effort Syndrome	Dr. P. H. Wood, M.D., F.R.C.P.
	11.30 A.M.	The Prevention in Barracks and the Field of Certain Wartime Diseases of Special Military Importance.	Lieut.-Col. C. S. Ryles, O.B.E., R.A.M.C.
	1.30 P.M.	Treatment of Gas Casualties.	Prof. J. Nixon, C.M.G., M.D., F.R.C.P.
	3 P.M.	Prescribing in Wartime ..	Dr. P. Hamill, F.R.C.P.
Tuesday, 20th Jan.	10 A.M.	War Neuroses	Col. J. R. Rees, M.D., M.R.C.P.
	11.30 A.M.	Tuberculosis in Wartime and Industry.	Dr. A. J. Morland, M.R.C.S., L.R.C.P., M.B., B.S.
	1.30 P.M.	The Prevention in Barracks of Certain Wartime Diseases.	Lieut.-Col. C. S. Ryles, O.B.E., R.A.M.C.
	3 P.M.	Effects of Blast	Dr. S. Zuckerman, M.A., D.Sc.
Wednesday, 21st Jan.	10 A.M.	Skin Diseases in War ..	Dr. R. T. Brain, M.D., F.R.C.P.
	11.30 A.M.	The Pathology of War Gas Poisoning.	Prof. G. R. Cameron, D.Sc.
	1.30 P.M.	War Neuroses (*contd.*) ..	Col. J. R. Rees, M.D., M.R.C.P.
	3 P.M.	Dyspepsia in War	Dr. C. E. Newman, F.R.C.P., and Mr. R. T. Payne, M.S., F.R.C.S.
Thursday, 22nd Jan.	10 A.M.	T.N.T. Poisoning and War Hazards of Industry.	Dr. Donald Hunter, M.D., F.R.C.P.
	11.30 A.M.	Protective Inoculation with Special Reference to Tetanus.	Dr. P. Hartley, M.D., F.R.C.P.
	1.30 P.M.	Medical Aspects of Head Injuries.	Major W. R. Russell, M.D., F.R.C.P.
	3 P.M.	Food Poisoning	Prof. J. H. Dible, F.R.C.P.
Friday, 23rd Jan.	10 A.M.	Crush Injuries	Dr. E. G. Bywaters, M.R.C.P.
	11.30 A.M.	Sulphonamide Drugs in War.	Col. L. E. H. Whitby, C.V.O., M.D., F.R.C.P.
	1.30 P.M.	Salt and Water	Dr. R. A. McCance, M.D., F.R.C.P.
	2.30 P.M.	Practical Management of Wound Shock.	Dr. J. McMichael, M.D., F.R.C.P., F.R.S.E.

The fee for the Course is one guinea. Officers of the Armed Forces wishing to attend these lectures without payment of the fee should apply through their respective Director-Generals. Applications for admission should be addressed to the DEAN, British Postgraduate Medical School, Ducane-road, London, W.12.

Further War Surgery Courses will commence as follows :—

TREATMENT OF FRACTURES .. MONDAY, 2ND FEBRUARY, 1942.
WAR SURGERY OF THE CHEST .. MONDAY, 16TH FEBRUARY, 1942.

L. M. S. S. A.

FINAL EXAMINATION: SURGERY, February 9th, March 9th, April 13th, 1942; MEDICINE, February 16th, March 16th, April 20th, 1942; MIDWIFERY, February 17th March 17th, April 21st, 1942.

For regulations apply REGISTRAR, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

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Prospectuses containing full information may be obtained on application to Professor W. J. DILLING, Dean of the Faculty of Medicine, The University of Liverpool.

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The comfort of sensitive patients is greatly enhanced by the fact that the majority are given single bedrooms.

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SPECIAL TREATMENT (Insulin, Cardiazol,Triazol, &c.) is given to suitable cases.

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The promotion of physical fitness is a prominent item of treatment and this is enhanced by arrangements for patients to take part in Outdoor and Indoor Sports and Entertainments, and special attention is drawn to the physical drill and dancing classes which form part of the regular hospital routine.

Application should be made to the Physician-Superintendent.

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A CLINIC for Neuroses and Early Psychoses of Good Prognosis instituted by the London County Council. Facilities for *out-patient treatment only*. Cases seen from 10 A.M. to 12 NOON from Monday to Friday inclusive. Inquiries of medical officer in charge at Sutton E. Hospital, Sutton, Surrey. Clinics for children held at Maudsley Hospital at 10 A.M. on Mondays.

Out-patient clinics for adults held also at St. Charles' Hospital, St. Charles' Square, Ladbroke Grove, W.10, on Wednesdays at 10 A.M. in winter and 2 P.M. in summer, and on Fridays at 10 A.M. (throughout year); at St. Mary (Islington) Hospital, Highgate Hill, N.19, on Tuesdays and Fridays at 2 P.M.; and at Mile End Hospital, Bancroft Road, E.1, on Thursdays at 10 A.M.

Attendance at the Children's Clinics at Maudsley Hospital and at the Clinics at St. Charles', St. Mary (Islington), and Mile End Hospitals by appointment with the Psychiatric Social Worker at Mill Hill E. Hospital, N.W.7.

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The following appointment as Examining Surgeon under the Factories Act, 1937, is vacant.

Applications should be sent to the CHIEF INSPECTOR OF FACTORIES, 28, Broadway, S.W.1.

District	*County*	*Latest date for receipt of application*
THURSO ..	CAITHNESS ..	13th January, 1942

Battersea General Hospital,
London, S.W.11.

APPOINTMENT OF HOUSE SURGEON (A).

Applications are invited from registered medical practitioners, Male or Female, for the above appointment, including R practitioners within three months of qualification. The appointment is for six months. Salary is at the rate of £180 per annum, with full residential emoluments.

Applications, stating age, nationality, and qualifications, and accompanied by copies of two recent testimonials, should be sent to the SECRETARY of the Hospital immediately.

Middlesex County Council.

MIDDLESEX COLONY, SHENLEY, Near ST. ALBANS, HERTS.

THIRD ASSISTANT MEDICAL OFFICER (B1) (Temporary) required immediately at the above-named Institution certified for the reception of mental defectives. Suitably qualified R practitioners holding B1 or B2 appointments may apply. Commencing salary £365 per annum (an increment considered at end of twelve months' satisfactory service), plus furnished apartments, board, and attendance.

Applications (no forms provided) to be addressed to Medical Superintendent, "B3," of Colony.

C. W. RADCLIFFE, Clerk of the County Council.
Guildhall, Westminster, S.W.1.

Middlesex County Council.

RESIDENT ASSISTANT MEDICAL OFFICER (B1) required for WEST MIDDLESEX COUNTY HOSPITAL, Isleworth, Middlesex. Applicants must be registered medical practitioners (including suitably qualified R practitioners holding B2 or B1 posts) who have held resident appointments in general hospitals and had special surgical experience. Post now vacant. Salary £400 by £25 to £475 per annum. Board, lodging, and laundry. Whole-time duties, such as Council may direct, under supervision of Medical Superintendent. Appointment is for four years only, subject to medical examination and one month's notice.

Applications, stating age, nationality, qualifications with dates, and experience, to the undersigned. Application forms not provided. Relationship to any member or officer of the Council to be disclosed. Copies of not more than three recent testimonials. Canvassing, directly or indirectly, will disqualify. Closing date 17th January, 1942.

C. W. RADCLIFFE, "B3," Clerk of the County Council.
Guildhall, Westminster, S.W.1.

Elizabeth Garrett Anderson Hospital.

Applications are invited from fully qualified medical Women for the following posts:—

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1.—B2 post: One RESIDENT MEDICAL OFFICER.

OSTER HOUSE HOSPITAL, St. Albans.—B2 post: One RESIDENT MEDICAL OFFICER, with care of surgical beds. Suitably qualified Women practitioners now holding A or B2 appointments may apply. Also an A post: One HOUSE PHYSICIAN.

Appointments to commence 1st February, 1942, for six months. Salaries on E.M.S. scale, with a minimum of £125 per annum, will be pooled and allocated according to experience.

Applications, with two copies of each of three testimonials, should be sent to the SECRETARY of the Elizabeth Garrett Anderson Hospital by 19th January, 1942.

British Postgraduate Medical School.
(UNIVERSITY OF LONDON.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE PHYSICIAN AND HOUSE SURGEON (A) on 1st February, 1942, including R practitioners within three months of qualification. The appointment is for six months and carries a salary of £105 per annum, plus the usual residential emoluments.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of three recent testimonials, should be sent to the DEAN, British Postgraduate Medical School, Ducane-road, W.12, not later than Tuesday, 13th January, 1942.

St. John's Hospital, Lewisham, S.E.13.

Applications are invited from registered medical practitioners (Male or Female) for the appointment of a HOUSE SURGEON (A), to become vacant on 1st February, 1942, including R practitioners within three months of qualification when appointment will be for a period of six months; otherwise it will be for a period of three months. Salary £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of three recent testimonials, should be sent as soon as possible to the undersigned.

J. C. GILBERT, Secretary-Superintendent.

Herefordshire County Council.

Applications are invited from registered medical practitioners for the combined post of MEDICAL SUPERINTENDENT at the COUNTY COUNCIL'S TUBERCULOSIS SANATORIUM, Nieuport, and CLINICAL TUBERCULOSIS OFFICER.

The duties will be mainly concerned with tuberculosis work, but if sufficiently qualified in general medicine the successful candidate may be asked to attend general medical cases at the County Council Hospital, Hereford.

Salary £750 per annum, rising by biennial increments of £50 to £937 10s. per annum, from which £120 per annum will be deducted for the value of residential emoluments. The commencing salary may be increased in accordance with the successful candidate's qualifications and experience.

Travelling expenses will be paid according to the County Council's scale.

Further particulars can be obtained from the CLERK of the County Council, Shirehall, Hereford, by whom applications must be received not later than the 17th January, 1942.

HIS MAJESTY'S COLONIAL SERVICE

THE COLONIAL MEDICAL SERVICE

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The maintenance of an efficient Colonial Medical Service constitutes a vital part of the national war effort and it is most important that the Service should be assured of an adequate supply of doctors.

The Secretary of State for the Colonies therefore invites applications from doctors possessing a medical qualification registrable in the United Kingdom who are British subjects and who are under thirty-five years of age.

Medical Officers are appointed in the first instance for general service. But there are ample opportunities for work in special branches of medicine and surgery, in public health and in medical research.

The normal salary scale is from £600 to between £1,000 and £1,120. There are large numbers of super-scale posts to which promotion is made on merit and which carry higher salaries.

Government quarters, in many cases free of rent, and first-class passages to and from the Colonies are provided, and an adequate pension scheme is in force.

Selected candidates are normally required to attend a course of instruction in Tropical Medicine and Hygiene either before proceeding overseas or during their first period of leave.

Further particulars, including the regulations governing admission to the Colonial Medical Service, may be obtained from the Director of Recruitment (Colonial Service), 2, Park-street, London, W.1.

Borough of Ilford.

APPOINTMENT OF TEMPORARY ASSISTANT MEDICAL OFFICER OF HEALTH.

Applications are invited from legally qualified medical practitioners for the above whole-time appointment at a salary of £700 per annum (plus 10 per cent. bonus on the first £450 of such salary), for duties in connexion with Maternity and Child Welfare, Isolation Hospital, School Medical Service, Civil Defence, and General Public Health work in the absence of the holder of the appointment on military service.

The above appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the selected applicant will be required to pass a medical examination by and to the satisfaction of the Medical Officer of Health. The appointment will also be subject to one month's notice on either side.

Applications on the prescribed form, obtainable from my office, accompanied by copies of three recent testimonials, must be received by me not later than Saturday, the 17th January, 1942.

Canvassing, directly or indirectly, will be a disqualification.

CHARLES N. ROBERTS, Town Clerk.

Town Hall, Ilford, 30th December, 1941.

Chesterfield and North Derbyshire ROYAL HOSPITAL.

(460 Medical and Surgical Beds.)

Applications are invited from registered medical practitioners (Male or Female), including R practitioners within three months of qualification, for the appointment of a HOUSE SURGEON (A), to commence immediately, for a period of six months. Salary £150 per annum, with full residential emoluments. The successful applicant will be required to reside in and also carry out duty at the Hospital Annexe (80 Beds).

Applications, stating nationality, age, and qualifications with dates, together with copies of three recent testimonials, should be sent to the undersigned as soon as possible.

M. H. BOONE, House Governor and Secretary.

29th December, 1941.

Beckett Hospital and Dispensary, BARNSLEY.

Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON (A). R practitioners within three months of qualification may apply, when appointment will be for a period of six months. Salary £150 per annum, with board, residence, and laundry.

Applications, stating age, qualifications with dates, nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

ARTHUR L. BOURNE, Secretary-Superintendent.

9th December, 1941.

The Staffordshire General Infirmary, STAFFORD.

Applications are invited from registered medical practitioners, Male and Female, for the appointment of a HOUSE SURGEON (A), including R practitioners within three months of qualification. The appointment will be for six months. Salary £175 per annum, with board-residence.

Applications, stating age, qualifications, and experience, accompanied by copies of three recent testimonials, should be sent to me forthwith.

Stafford, 5th December, 1941. A. E. COLLINS, Secretary.

Preston and County of Lancaster ROYAL INFIRMARY.

Applications are invited from registered medical practitioners for the post of HOUSE SURGEON (A) to the EYE AND EAR, NOSE, AND THROAT DEPARTMENT. R practitioners within three months of qualification may apply, when appointment will be for a period of six months. Salary at the rate of £150 per annum, with the usual residential allowances.

Applications, stating age and qualifications with dates, and nationality, and accompanied by copy testimonials, should be sent to Mr. JOHN GIBSON, Superintendent and Secretary.

Chelmsford and Essex Hospital, London-road, CHELMSFORD, ESSEX.

(235 Beds.)

Applications are invited for the post of CASUALTY OFFICER AND RESIDENT ANÆSTHETIST (A), Male or Female. R practitioners within three months of qualification may apply, when appointment will be for a period of six months. Salary £150 per annum, plus board, lodging, and laundry.

Apply, with recent testimonials, to the undersigned immediately. R. G. MORRISH, House Governor and Secretary.

Kent County Council.

Applications are invited from registered medical practitioners for the appointment of TEMPORARY RESIDENT ASSISTANT SURGEON (B1) at the ROYAL VICTORIA HOSPITAL, Folkestone. Applicants should have held house appointments and had surgical experience. The possession of higher surgical qualifications will be considered an advantage. Suitably qualified resident R practitioners holding B2 or B1 appointments are invited to apply. Salary is at the rate of £550 a year, with full residential emoluments. Existing superannuation rights can be safeguarded.

Applications, stating age, qualifications, experience, and nationality, should be sent to the County Medical Officer, County Hall, Maidstone, not later than 20th January, 1942.

W. L. PLATTS, Clerk of the County Council.

County Hall, Maidstone, 24th December, 1941.

County Borough of Blackpool.

Applications are invited for a RESIDENT ASSISTANT MATERNITY AND CHILD WELFARE MEDICAL OFFICER under the Government Evacuation Scheme. The salary will be at the rate of £400 per annum, plus the usual emoluments, and the appointment will be determined by one month's notice on either side. The successful candidate will be required to live in either the Kimberley or the Caledonian Emergency Maternity Home and to undertake part of the work in these Homes in addition to assisting at the various antenatal clinics, and taking part in anæsthetic work in connexion with the Maternity Scheme generally.

Applications, stating age, qualifications, and experience, should be addressed to the Medical Officer of Health, Municipal Health Centre, Whitegate-drive, Blackpool, so as to arrive not later than the 20th January, 1942.

TREVOR T. JONES, Town Clerk.

The Royal Liverpool United Hospital.

Applications are invited from registered medical practitioners, Male and Female, including R practitioners within three months of qualification, for appointments as HOUSE PHYSICIANS and HOUSE SURGEONS (A), and those holding A posts as CASUALTY OFFICERS (B2) in the Liverpool Royal Infirmary, David Lewis Northern Hospital, Royal Southern Hospital, and Liverpool Stanley Hospital branches of the United Hospital. The appointments are to commence immediately, and if held by R practitioners they will be for six months. Salary is at the rate of £70 per annum for House Physicians and House Surgeons and £100 per annum for Casualty Officers, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and testimonials, should be sent to the undersigned not later than Tuesday, 13th January, 1942.

A. V. J. HINDS, Secretary.

The Royal Liverpool United Hospital, 60, Rodney-street, Liverpool, 1, 3rd January, 1942.

The Lawn, Lincoln.

(Registered Hospital for Mental and Nervous Diseases.)

Applications are invited from registered medical practitioners, including R practitioners who now hold A posts, for an ASSISTANT MEDICAL OFFICER (B2), one with previous mental hospital experience preferred. If held by an R practitioner, appointment will be limited to six months. Salary £300 per annum, with emoluments and war bonus. Apply, THE CHAIRMAN OF GOVERNORS, The Lawn, Lincoln.

Borough of Reigate.

APPOINTMENT OF ASSISTANT MEDICAL OFFICER OF HEALTH AND ASSISTANT SCHOOL MEDICAL OFFICER (TEMPORARY).

Applications are invited from registered medical practitioners for the temporary whole-time appointment of Assistant Medical Officer of Health and Assistant School Medical Officer.

The person appointed will work under the direction of the Medical Officer of Health and will undertake duties in the Public Health and School Medical Departments, together with such other duties as may from time to time be prescribed. Preference will be given to applicants holding a registrable degree or diploma in public health and having previous experience in the duties of the office.

The salary will be at the rate of £600 per annum, plus cost-of-living bonus (at present £24 per annum). Reasonable out-of-pocket expenses for travelling, &c., will be paid by the Council.

The appointment will be subject to two months' notice on either side and may be subject also to the provisions of the Local Government Superannuation Act, 1937, for which purpose the successful candidate will be required to pass a medical examination.

Forms of application and further particulars of the appointment may be obtained from the Medical Officer of Health, Public Health Department, Town Hall, Reigate. The completed forms, together with copies of not more than three recent testimonials, should reach the undersigned not later than NOON on Saturday, 17th January, 1942.

HEBER DAVIES, Town Clerk.

Town Hall, Reigate, 24th December, 1941.

Hampshire County Council.

THE COUNTY COUNCIL HOSPITAL, ALTON.

RESIDENT HOUSE OFFICER (Male or Female) required at this Hospital at a salary of £150 per annum (A post). R practitioners within three months of qualification may apply when appointment will be for a period of six months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three testimonials, should be sent to the undersigned as soon as possible.

H. LESLIE CRONK, County Medical Officer.

The Castle, Winchester.

Liverpool and District Hospital for

DISEASES OF THE HEART,
34, Oxford-street, LIVERPOOL, 7.

Applications are invited from registered medical practitioners (Male and Female), including R practitioners within three months of qualification when appointment will be for a period of six months, for the appointment of a HOUSE PHYSICIAN (A), to commence immediately. Salary is at the rate of £100 per annum, with full residential emoluments. Facilities for M.D. thesis.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned.

Miss J. LEWIS, Secretary.

Cheltenham General and Eye Hospitals.

(176 Beds.)

Recognised for the F.R.C.S., D.L.O., and D.O.M.S. Examinations.

The Board of Management invite applications for the post of HOUSE SURGEON (A) (Male) at the General Hospital, now vacant owing to call-up. Candidates must be of British nationality and fully qualified. Salary £150 per annum, with board, lodging, and laundry. R practitioners within three months of qualification may apply when appointment will be for a period of six months.

Applications, with copies of testimonials, to be sent in sealed envelopes marked "House Surgeon" to the undersigned as soon as possible.

J. CUMMING SMITH, F.C.I.S., F.H.O.A., Secretary.

The General Hospital, Cheltenham, 24th December, 1941.

Royal Albert Edward Infirmary

AND DISPENSARY, WIGAN. (Normally 189 Beds.)

Applications are invited from registered medical practitioners (Male), including R Practitioners within three months of qualification, for the appointment of a HOUSE SURGEON (A) to become vacant on February 1st, 1942, when appointment will be for a period of six months. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned as soon as possible.

A. STANLEY BRUNT, General Superintendent and Secretary.

29th December, 1941.

Royal South Hants and Southampton

HOSPITAL, SOUTHAMPTON. (255 Beds.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (A), to become vacant on 1st February, 1942, including R practitioners within three months of qualification. The appointment will be for a period of six months. The salary is at the rate of £175 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

E. L. WIRGMAN, House Governor.

Oldham Royal Infirmary.

(186 Beds.)

APPOINTMENT OF ANÆSTHETIST.

Applications are invited for the above appointment, for a period of twelve months. The Anæsthetist will be required to attend on the days of the Surgeons' operations and at other times as requested by the Surgeon under whom they act. The payment will be at the rate of £2 12s. 6d. per session.

Applications, stating age, experience and qualifications, together with three recent testimonials, to be forwarded to the undersigned not later than Saturday, the 17th January, 1942. Canvassing will be disqualified.

F. W. BARNETT, General Superintendent and Secretary.

Walsall General Hospital.

(181 Beds.)

Applications are invited from registered medical practitioners for the appointment of a HOUSE SURGEON (A), to become vacant on the 14th January, 1942, including R practitioners within three months of qualification. The appointment will be for a period of six months. Salary at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should reach the undersigned as soon as possible.

R. C. MILLWARD, House Governor.

Kent and Sussex Hospital.

Applications are invited from registered medical practitioners (Male) for the appointment of HOUSE SURGEON (B2), to become vacant 4th February, 1942, including R practitioners who hold A posts when appointment will be limited to six months. The salary is at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, accompanied by copies of three recent testimonials, should be sent to the undersigned as soon as possible.

TOM B. HARRISON, Superintendent-Secretary.

24th December, 1941.

Stockport Infirmary.

Applications are invited from unmarried registered medical practitioners, Male or Female, for the appointment of HOUSE SURGEON (A) (AURAL, OPHTHALMIC, AND GYNÆCOLOGICAL), post becoming vacant on 31st January, including R practitioners within three months of qualification when appointment will be for a period of six months. Salary at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, accompanied by copies of three recent testimonials, should be sent to the undersigned not later than 6th January.

H. G. PRICE, Secretary-Superintendent.

The Royal Infirmary, Sunderland.

Applications are invited from Male registered medical practitioners, including R practitioners within three months of qualification, for the appointment of HOUSE SURGEON (A). The appointment will be limited to six months. The salary is at the rate of £120 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned at the earliest possible date.

M. J. HUNTLEY, House Governor and Secretary.

Kent and Sussex Hospital.

Applications are invited from registered medical practitioners, Male, for the appointment of RESIDENT HOUSE PHYSICIAN (B2), to become vacant 1st February, 1942, including R practitioners who hold A posts when the appointment will be limited to six months. The salary is at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

TOM B. HARRISON, Superintendent-Secretary.

24th December, 1941.

Royal Hampshire County Hospital,

WINCHESTER. (461 Beds.)

Applications are invited from registered medical practitioners, including R practitioners within three months of qualification, for the appointment of HOUSE PHYSICIAN (A). The appointment will be for a period of six months. Salary is at the rate of £175 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

H. EWART MITCHELL, Superintendent and Secretary.

Harlow Wood Orthopædic Hospital,

Near MANSFIELD, NOTTS. (275 Beds.)

Applications are invited for the post of Male HOUSE SURGEON (B2). Salary £200 per annum, with residential emoluments. The duties may include attendance at the associated Out-patient Clinics. R practitioners holding A posts may apply when appointment will be limited to six months.

Applications, stating age and experience, with copies of testimonials, should be received by the SECRETARY by 10th January.

County Borough of Dudley.

TEMPORARY ASSISTANT MEDICAL OFFICER OF HEALTH AND ASSISTANT SCHOOL MEDICAL OFFICER (MALE OR FEMALE).

Applications are invited from duly qualified medical practitioners for the post of Temporary Assistant Medical Officer of Health and Assistant School Medical Officer.

The duties will consist of maternity and child welfare work, school medical work, and any other duties which may from time to time be prescribed.

The person appointed must reside within the Borough, devote whole time to the duties of the office, and will not be allowed to engage in private practice.

The appointment will be subject to three months' notice on either side and to the provisions of the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination.

The salary will be £500 per annum, rising by annual increments of £25 to a maximum of £700, and in addition a war bonus and travelling allowance will be paid.

Applications, endorsed "Assistant Medical Officer of Health," stating age, qualifications, and experience, accompanied by copies of not more than three testimonials, should reach the undersigned not later than 12th January, 1941.

GEO. C. V. CANT, Town Clerk.

The Council House, Dudley, Worcs.

City of Manchester.

BOOTH HALL HOSPITAL. (760 Beds.)

APPOINTMENT OF RESIDENT ASSISTANT MEDICAL OFFICER (A).

Applications are invited from registered medical practitioners (Male or Female) for the above-mentioned appointment which is vacant now, including R practitioners within three months of qualification when appointment will be for a period of six months; otherwise it will be for a period of twelve months. No vacancies exist at the Hospital for an alien medical officer at present.

The basic salary for the appointment is £200 per annum or, if held by an R practitioner, £125 per annum, with board, residence, and laundry in addition. A temporary cost-of-living wages award is payable in addition to the foregoing salaries. The appointment is subject to the Manchester Corporation conditions of service.

Full information and forms of application may be obtained from the Medical Officer of Health, Hospitals Administration Section, P.O. Box 399, Town Hall, Manchester, 2, and applications for the post must be received by him not later than 12th January, 1942.

Canvassing in any form is prohibited.

R. H. ADCOCK, Town Clerk.

Town Hall, Manchester, 2, 23rd December, 1941.

City and County of Bristol.

DEPARTMENT OF PUBLIC HEALTH.

SNOWDON ROAD HOSPITAL.

Applications are invited from registered medical practitioners for the appointment of an ASSISTANT RESIDENT MEDICAL OFFICER (B1). Applicants should have held house appointments. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. Salary is at the rate of £350 per annum, with full residential emoluments.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, accompanied by copies of three recent testimonials, should be sent to the undersigned forthwith.

R. H. PARRY, Medical Officer of Health.

Department of Public Health, Kenwith Lodge, Westbury Park, Bristol, 6, 27th December, 1941.

County Borough of Brighton.

JUNIOR RESIDENT MEDICAL OFFICER (B2) AT INFECTIOUS DISEASE HOSPITAL AND SANATORIUM.

Applications are invited for the above appointment from registered medical practitioners (Male or Female). In the case of male applicants this includes R practitioners who now hold A posts when appointment will be limited to six months. Salary £250 per annum, with board and lodging. The appointment affords opportunities for experience in all branches of the work of a Health Department, including Civil Defence duties.

Particulars and forms of application can be obtained from the undersigned and must be returned to my office not later than Monday, 19th January, 1942.

RUTHERFORD CRAMB, Medical Officer of Health.

Royal York Buildings, Brighton, 1, 29th December, 1941.

The Hospital, Powick,

Near WORCESTER.

APPOINTMENT OF RESIDENT SURGICAL OFFICER (MALE) (B2).

Applications are invited from registered medical practitioners for the above appointment, which is now vacant, including R practitioners who now hold A appointments. The appointment will be limited to six months. Salary £200 per annum, together with board, lodging, washing, and attendance. The appointment is subject to one month's notice on either side.

Applications, stating age, nationality, qualifications with dates, present post, and accompanied by copies of three recent testimonials, should be sent to the MEDICAL SUPERINTENDENT not later than Monday, 12th January.

City and County of Newcastle upon TYNE.

NEWCASTLE GENERAL HOSPITAL. (900 Beds.)
SHOTLEY BRIDGE HOSPITAL. (900 Beds.)

APPOINTMENT OF HOUSE PHYSICIANS (A) AND HOUSE SURGEONS (A).

Applications are invited from registered medical practitioners for the above appointments, including R practitioners within three months of qualification. The appointments will be tenable for a period of six months. Salary £150 per annum, together with the usual residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of two recent testimonials, should be forwarded immediately to the MEDICAL OFFICER OF HEALTH, Health Department, Town Hall, Newcastle upon Tyne, 1.

City and County of Newcastle upon TYNE.

NEWCASTLE GENERAL HOSPITAL.

Applications are invited from registered medical practitioners for the post of Whole-time TEMPORARY REGISTRAR (B1) in the NEUROSURGICAL DEPARTMENT, now vacant. Applicants should have held previous surgical house appointments. Suitably qualified R practitioners holding B1 or B2 appointments are invited to apply. Salary £350 per annum, together with the usual residential emoluments.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent immediately to the MEDICAL OFFICER OF HEALTH, Health Department, Town Hall, Newcastle upon Tyne, 1.

The Board of Control (Lunacy and MENTAL DEFICIENCY) invite applications for the following post at RAMPTON STATE INSTITUTION FOR MENTAL DEFECTIVES, near Retford, Notts:—

DEPUTY MEDICAL SUPERINTENDENT (Male or Female). Salary £850, rising by five annual increments to £1000.

Emoluments are, for a man, (*a*) a house rent free or, alternatively, (*b*) free furnished single quarters and laundry, with board and service provided on payment of actual cost; for a woman, as at (*b*).

Candidates must be registered medical practitioners (Male or Female) and must conform to the Civil Service nationality rule. Men may be unmarried, married, or widowers, and, if unmarried, must be prepared to live in the Institution. Women must be unmarried or widows, and must resign the appointment on marriage. The post is pensionable under the Civil Service Superannuation Acts.

A form of application, with further particulars, can be obtained from the SECRETARY, Board of Control, Clifton Hotel, St. Annes-on-Sea, Lancashire, and must be completed and returned to him not later than 31st January, 1942.

Municipal General Hospital, Burnley.

(250 Beds.)

APPOINTMENT OF JUNIOR RESIDENT MEDICAL OFFICER (A).

Applications are invited from registered medical practitioners, Male and Female, for the above appointment (A), which is now vacant, including R practitioners within three months of qualification. If held by an R practitioner, appointment will be for a period of six months; otherwise it will be for a period of twelve months. Salary is at the rate of £150 per annum for the first six months and £200 per annum for the second six months, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of recent testimonials, should be sent to the MEDICAL OFFICER OF HEALTH, 27, St. James's-street, Burnley, as soon as possible.

Montagu Hospital, Mexborough.

(120 Beds—3 Residents.)

Applications are invited from registered medical practitioners for the post of RESIDENT HOUSE SURGEON (A) (Male), to become vacant at the beginning of February, 1942. R practitioners within three months of qualification may apply when appointment will be for a period of six months; otherwise it will be subject to renewal. This post offers excellent opportunity for experience in all branches of surgery. Salary £200 per annum, with usual residential emoluments.

Applications, stating age, nationality, qualifications, and experience, accompanied with copy testimonials, to be sent to the undersigned immediately.

A. LAYCOCK, Secretary-Superintendent.

Royal Buckinghamshire Hospital,

AYLESBURY. (150 Beds—3 Residents.)

Applications are invited from registered medical practitioners (Male and Female) for the post of HOUSE SURGEON (A), now vacant. Salary £120 per annum, with board, residence, and laundry. R practitioners within three months of qualification are eligible to apply, when appointment will be for a period of six months. Opportunity is afforded to work with London Specialists.

Applications, stating age, qualifications with dates, nationality, together with copies of two recent testimonials, should be sent to the undersigned immediately.

F. G. DAWES, Secretary-Superintendent.

County Borough of Smethwick.

TEMPORARY RESIDENT MEDICAL OFFICER AND ASSISTANT MEDICAL OFFICER OF HEALTH (B1 POST)

Applications are invited from registered medical practitioners (Male or Female) for the post of Resident Medical Officer at the Smethwick and Oldbury Joint Isolation Hospital, and Assistant Medical Officer of Health and Assistant School Medical Officer for the County Borough of Smethwick. The appointment is temporary during the absence of the present officer on war service. Salary will be at the rate of £550 per annum, from which a deduction of £150 per annum will be made in respect of board, residence and laundry. The applicant will be required to reside at the Fever Hospital and undertake the clinical care of the patients and will also be expected to do School Medical Inspection and Infant Welfare work, and such other work as may be required by the Medical Officer of Health. Previous experience as a Resident in a Fever Hospital is essential. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply.

Forms of application may be obtained from the Medical Officer of Health, Public Health Department, Hales Lane, Smethwick, to whom applications endorsed "Assistant Medical Officer of Health, &c." and accompanied by copies of three recent testimonials should be delivered as soon as possible.

Canvassing, directly or indirectly, will disqualify.

FRANK CHAPMAN, Town Clerk.

Council House, Smethwick, 20th December, 1941.

Lancashire County Council.

COUNTY HOSPITAL, WHISTON, PRESCOT, NR. LIVERPOOL.

APPOINTMENT OF JUNIOR RESIDENT MEDICAL OFFICER (A).

Applications are invited for the above appointment from registered medical practitioners, Male and Female, including R practitioners within three months of qualification. The hospital is a general hospital dealing with acute work and comprises 1300 beds. Salary is at the rate of £120 per annum, together with the usual residential emoluments and the appointment will be for a period of six months.

The person appointed will be required to take up duty at an early date. Forms of application may be obtained from the County Medical Officer of Health, Hospital and Medical Department, County Offices, Preston, to whom all applications, accompanied by copies of not more than two recent testimonials, must be forwarded not later than Monday, the 12th January, 1942.

GEORGE ETHERTON, Clerk of the County Council.

County Offices, Preston, 20th December, 1941.

Northumberland County Council.

HEXHAM HOSPITAL. (100 Beds.)

APPOINTMENT OF HOUSE SURGEON (A).

Applications are invited from registered medical practitioners for the above appointment, including R practitioners within three months of qualification. The appointment will be tenable for a period of six months. Salary £120 per annum, together with the usual residential emoluments.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of two recent testimonials, should be forwarded immediately to the Department of the County Medical Officer, New Senior School, Mitford Road, Morpeth, Northumberland.

C. HAROLD CARTER, Clerk of the Council.

Bedford County Hospital.

Applications are invited from registered medical practitioners, Male and Female, for the appointment of a HOUSE SURGEON (A post), to become vacant the middle of January including R practitioners within three months of qualification when appointment will be for a period of six months. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the SECRETARY, Honorary Medical Staff Committee, as soon as possible.

Bexhill Hospital, Bexhill-on-Sea.

Applications are invited from registered medical practitioners, Male or Female, for the appointment of a RESIDENT MEDICAL OFFICER (A), including R practitioners within three months of qualification when appointment will be for a period of six months. Salary is at the rate of £175 per annum, with board, residence, and laundry.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

FREDK. GEARY, Secretary.

Bristol Royal Hospital.

RADIO DIAGNOSTICIAN.

The services of a duly qualified whole-time Radio Diagnostician are temporarily required in the Radiological Department at the Bristol General Hospital. Salary £500 per annum, non-resident.

Applications, stating age and experience, accompanied by copies of testimonials, to be forwarded to the undersigned, from whom further particulars may be obtained.

THOMAS W. GREGG, F.C.C.S., Secretary.

Bristol General Hospital.

Norfolk and Norwich Hospital,

NORWICH. (440 Beds.)

Applications are invited from registered medical practitioners (Male and Female), including R practitioners within three months of qualification, for the following A appointments:—

HOUSE PHYSICIAN,
GENERAL HOUSE SURGEON,
HOUSE SURGEON TO THE ORTHOPÆDIC DEPARTMENT.

The appointments will be for six months. Salary at the rate of £170 per annum, with full residential emoluments. Applicants may apply for more than one of the above posts, and if so must state the order of their preference.

Applications, stating age, nationality, qualifications, and accompanied by copies of three testimonials, should be sent to the undersigned not later than Tuesday, 6th January, 1942.

FRANK INCH, House Governor and Secretary.

East Suffolk and Ipswich Hospital,

IPSWICH.
(400 Beds.)

Applications are invited from registered medical practitioners for the appointment of RESIDENT MEDICAL OFFICER (B1) to this Hospital and Medical Superintendent to the Branch Hospital (50 Beds), vacant on 10th March, 1942. Applicants should have held house appointments and had surgical experience. Preference will be given to candidates holding Diploma of F.R.C.S. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. The minimum salary is £350 or according to qualifications and experience.

Applications, stating age, nationality, qualifications with dates, experience and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to the undersigned. ARTHUR GRIFFITHS, Secretary.

The Hospital, Ipswich, 27th December, 1941.

General Hospital, Nottingham.

(495 Beds + 75 M.S. Beds.)

Applications are invited from registered medical practitioners (Male and Female), including R practitioners within three months of qualification, for the appointment of RESIDENT CASUALTY OFFICER (A) for the above Hospital. Duties to commence on 24th January. The appointment is for six months. Salary at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and copies of testimonials, should be sent to the undersigned.

HENRY M. STANLEY, House Governor and Secretary.

General Hospital, Nottingham.

(Total 570 Beds.)

Applications are invited from registered medical practitioners (Male or Female), including R practitioners within three months of qualification, for the appointment of a HOUSE SURGEON (A) for the above Hospital. The appointment is for six months. Duties to commence on 24th January. Salary at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and copies of testimonials, should be sent to the undersigned.

HENRY M. STANLEY, House Governor and Secretary.

Kettering and District General HOSPITAL.

APPOINTMENT OF A HOUSE PHYSICIAN (A).

Applications are invited from registered medical practitioners for the appointment of a House Physician (A), including R practitioners within three months of qualification when appointment will be for a period of six months. Salary is at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned as soon as possible.

G. W. JACKSON, Secretary-Superintendent.

Harrogate Royal Bath Hospital.

(National Hospital for Rheumatic Diseases.)
(Normal complement, 146 Beds.)

Applications are invited from registered medical practitioners (Male) for the appointment of a HOUSE SURGEON (A), to become vacant in January, 1942, including R practitioners within three months of qualification. The appointment is for six months. Salary at the rate of £200 per annum, with full residential emoluments. Special facilities for study and research (thesis).

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of three recent testimonials, to be sent to the undersigned. E. P. L. DIXON, M.A.

Harrogate Royal Bath Hospital, Harrogate.

Bracebridge Heath Mental Hospital,

BRACEBRIDGE HEATH, Near LINCOLN.

TEMPORARY ASSISTANT MEDICAL OFFICER (B1).

Applications are invited from registered medical practitioners for the above (whole-time) appointment. R practitioners should not apply. Salary £7 7s. per week, with the usual residential emoluments. Additional £50 per annum if holder of the D.P.M. (Eng.).

Apply, with copies of testimonials, to the MEDICAL SUPERINTENDENT.

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Bristol Royal Hospital

(incorporating Bristol Royal Infirmary and Bristol General Hospital)
AND COSSHAM MEMORIAL HOSPITAL.

Applications are invited for the following resident appointments for the six months commencing 1st March, 1942 :—
Six HOUSE PHYSICIANS.
One HOUSE PHYSICIAN to the SKIN AND RADIOLOGICAL DEPARTMENT.
Nine HOUSE SURGEONS.
Two HOUSE SURGEONS to the GYNÆCOLOGICAL DEPARTMENT.
Three HOUSE SURGEONS to the CASUALTY DEPARTMENT.
Two HOUSE SURGEONS to the E.N.T. DEPARTMENT.
One HOUSE SURGEON to the OUT-PATIENT FRACTURE DEPARTMENT.
One HOUSE SURGEON to the IN-PATIENT FRACTURE DEPARTMENT.

Salaries at the rate of £80 per annum plus £20 per annum war bonus, except in the case of the Casualty House Surgeons who will receive salaries at the rate of £150 per annum plus £20 per annum war bonus and the two House Surgeons for Cossham Memorial Hospital who will receive salaries at the rate of £150 per annum.

Candidates, who must be registered medical practitioners, to send in their applications (on forms to be obtained from the undersigned) on or before 17th January, together with copies of not more than three testimonials. The elected candidates must become members of a Medical Defence Association before taking up their appointments.

All the above are A posts with the exception of the Casualty House Surgeons, which are B1 posts. R practitioners within three months of qualification may apply for the A posts when appointment will be for a period of six months, and suitably qualified R practitioners holding B2 or B1 posts may apply for the B1 posts.

ELLIS C. SMITH, F.C.I.S.,
Bristol Royal Infirmary. Secretary and House Governor.

City of Plymouth.

THE CITY ISOLATION HOSPITAL,
Beacon Park-road, PLYMOUTH.

Applications are invited from registered medical practitioners (unmarried, Male) for the appointment of ASSISTANT MEDICAL OFFICER (B1) at Swilly Isolation Hospital, Plymouth, which is for a period of six months, mutually renewable for a further similar period, terminable by one month's notice on either side. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. The salary will be at the rate of £300 per annum, plus a bonus valued at £15 12s. per annum, with full residential emoluments, and any fees received by the officer must be refunded to the Council. The successful candidate will be required to work under the direction of the Medical Superintendent, and will devote the whole of his time to official duties, which will consist mainly of work in the Hospital and assisting at certain venereal diseases clinics. (He should be able to drive a car.) In addition to the above, he will be required to perform any other duties allotted to him from time to time by the Medical Officer of Health.

Applications, stating age, qualifications, and experience, together with copies of not more than three recent testimonials, must reach the undersigned as soon as possible.

T. PEIRSON, Medical Officer of Health.
Beaumont House, Beaumont Park, Plymouth.

Doncaster Royal Infirmary.

Applications are invited from registered medical practitioners (Male), including R practitioners within three months of qualification, for the following appointments :—
HOUSE SURGEON (A).
CASUALTY HOUSE SURGEON (A).
Required immediately. The appointments are for six months. Salary in each case at the rate of £175 per annum, with residence, board, and laundry. This large industrial area offers excellent opportunities for gaining experience.

Applications, accompanied by not more than three testimonials, to be sent to the undersigned immediately.

R. LANCASTER, Secretary-Superintendent.

Prison Service—Medical Staff.

A vacancy exists for a Woman MEDICAL OFFICER at H.M. Prison, Holloway, to assist the other Medical Officers in a temporary capacity. The appointment is a part-time one—i.e., the holder undertakes its duties and responsibilities in conjunction with her private practice—and is not pensionable. The salary is £350 a year, inclusive.

Forms of application may be obtained from the PRISON COMMISSIONERS (Staff Branch), Oriel College, Oxford.

Berkshire County Council.

TEMPORARY ASSISTANT MEDICAL OFFICER FOR MATERNITY AND CHILD WELFARE (WOMAN).

Applications are invited from duly qualified medical Women who must have had at least three years' experience since qualification. Candidates should be experienced in antenatal work, midwifery, and children's diseases. The salary will be at the rate of £600 per annum. The appointment will be subject to one calendar month's notice on either side.

Forms of application may be obtained from the undersigned and should be returned by first post on 19th January, 1942.

H. J. C. NEOBARD, Clerk of the County Council.
Shire Hall, Reading.

Warneford General Hospital,

LEAMINGTON SPA.

Applications are invited from registered medical practitioners for the appointment of RESIDENT SURGICAL OFFICER (B1), to become vacant on 23rd January, 1942. Applicants should have held house appointments and had surgical experience. Preference will be given to candidates holding diploma of F.R.C.S. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. Salary is at the rate of £300 per annum, rising to £350 per annum.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than 15th January, 1942.

W. A. JAMES, House Governor and Secretary.

The Royal Hospital, Wolverhampton.

(Incorporated under Royal Charter.) (310 Beds.)

Applications are invited from registered medical practitioners, including R practitioners within three months of qualification, for the following post: HOUSE SURGEON, FRACTURE AND ORTHOPÆDIC DEPARTMENT (A). Duties to commence immediately. Salary at the rate of £100 per annum, with full residential emoluments. The appointment is for six months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

W. H. HARPER, House Governor.

The Royal Hospital, Wolverhampton.

(Incorporated under Royal Charter. 310 Beds.)

Applications are invited from registered medical practitioners, including R practitioners within three months of qualification, for the following post. CASUALTY OFFICER (A) vacant now. Salary at the rate of £200 per annum with full residential emoluments. The appointment is for six months.

Applications, stating age, qualifications, with dates and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

15th December, 1941. W. H. HARPER, House Governor.

Huddersfield Royal Infirmary.

(321 Beds.)

Male HOUSE SURGEON (A) required to commence duty on 14th January, 1942. R practitioners within three months of qualification may apply when appointment will be for a period of six months, otherwise is subject to renewal for a similar period of six months. Salary £150 per annum, with board, residence, and laundry. The Hospital is officially recognised for the surgical practice required of non-members before admission to the Final Fellowship Examination of the Royal College of Surgeons of England.

Applications, with copies of three recent testimonials, to be addressed to the undersigned.

H. J. JOHNSON, General Superintendent and Secretary.

Corporation of Glasgow.

PUBLIC HEALTH DEPARTMENT

Applications are invited for the post of MEDICAL SUPERINTENDENT of HAWKHEAD MENTAL HOSPITAL, CROOKSTON, near Glasgow. Salary £1000, rising by £60 biennially to maximum of £1300 per annum, together with emoluments valued at £150 per annum for purposes of Superannuation. Age under 45 years, unless already contributing to Superannuation under the Asylums Officers' Superannuation Act or other Local Authority Scheme.

Applications, stating exact date of birth, whether married or single, and giving full details of qualifications and experience in the treatment of mental diseases and mental hospital administration, together with copies of not more than three recent testimonials to be sent to the undersigned, in envelope marked "Hawkhead Mental Hospital—Appointment of Medical Superintendent," not later than Saturday, 10th January, 1942.

WILLIAM KERR, Town Clerk.
City Chambers, Glasgow, 16th December, 1941.

Required immediately, Full-time Assis-

TANT (Male or Female) to Works Medical Officer in large industrial organisation in north-west. Applicants should have university degree and have held house appointments. Pathological experience desirable. Salary according to qualifications. —Address No. 837, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Medical Practice.—For Sale, long-

established General Practice in South Side, Edinburgh. —Apply, CUNNINGHAM & LAWSON, Solicitors, 64, Frederick-street, Edinburgh.

Doctors' and Nurses' Dressing Scissors

accurately ground and set. 9d. per pair, post paid. Delivery per return.—ADAMS BROS., 15, Crescent-road, Tunbridge Wells.

The Proprietor of Patent No. 470579 for

"SPLINTS FOR BONE FRACTURES" is desirous of entering into negotiations with a firm or firms for the grant of a Licence under this Patent or to treat for the sale of the same outright. Full particulars may be obtained from WITHERS & SPOONER, Chartered Patent Agents, 148/150, Holborn, London, E.C.1.

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